

## A BASIC LIST OF THE LAND MOLLUSCA OF AUSTRALIA.—PART II.

By TOM IREDALE.\*

(Plates i.-iii.)

Before continuing with the list an omission of importance must be recorded, which also necessitates a correction. Hedley & Musson described a *Diplommantina egregia*, and, on account of its appearance, so unlike that of any *Diplommantina*, I introduced a new generic name, *Famarinia*, for it. Further consideration suggested that it did not belong to the operculates at all, but that it was a relation of *Themapupa*; it did not, however, exactly agree, and between the two places it was overlooked. Upon realising the omission it was re-examined, and then was found to be the species which Pilsbry had named *Pupoides hedleyi*, and had introduced a section, *Glyptopupoides*, which was used. Thus to the synonymy of *Glyptopupoides* must be added:—

1933. *Famarinia* Iredale, Rec. Austr. Mus., Vol. xix., p. 56, August 2.  
Orthotype, *Diplommantina egregia* Hedley & Musson.

And the specific name will become—

*GLYPTOPUPOIDES EGREGIA* Hedley & Musson, 1891.

1891. *Diplommantina egregia* Hedley & Musson, Proc. Linn. Soc. N.S.W., Ser. 2, Vol. vi., p. 561, text fig. 8, May 23, 1891. Calliungal, South Queensland.  
1926. *Pupoides hedleyi* Pilsbry, Man. Conch. (Tryon), Ser. 2, Vol. xxvii., p. 252, pl. 31, fig. 15, March. Bundaberg, Queensland.  
South Queensland.

Note.—Although Pilsbry separated it widely, this shell recalls *Pronesopupa* and may be related.

A minor omission may also be added:—

*MULATHENA TRANSLUCENS* Gabriel, 1934.

1934. *Thalassohelix translucens* Gabriel, Mem. Nat. Mus., Melb., Vol. viii., p. 157, pl. xviii., figs. 1-3, September. Wilson's Promontory, Victoria.  
Victoria (Wilson's Promontory).

Note.—This species was described by Gabriel under the generic name *Thalassohelix*, but that Neozelanic genus had been introduced many years previously, and after consideration definitely rejected.

Now to continue the list:—

## Family STENOPYLIDAE.

The extraordinary form here separated with family rank has been referred by Hedley to the Endodontidae. It disagrees with every member of that family in texture, form and apertural development. The mouth is thickened, almost closed, though there are internal lamellae, and there is no radial sculpture so characteristic of all Australasian "Endodontids".

## Genus STENOPYLIS Fulton, 1914.

1914. *Stenopylis* Fulton, Ann. Mag. Nat. Hist., Ser. 8, Vol. xiv., p. 163, August 1. Orthotype, *Planispira hemiclausula* Tate.

The distribution of the unique species suggests subdivision at some later period, but good series are not yet available.

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\*Continued from Vol. viii., pt. 4, p. 333, 1937.

## STENOPYLIS HEMICLAUSA Tate, 1894.

1894. *Planispira hemiclausa* Tate, Trans. Roy. Soc. South Austr., Vol. xviii., p. 192, November. Central Australia. Figd. Tate, Rep. Horn. Sci. Exped. Centr. Austr., pt. ii., Zool., p. 185, pl. xvii., fig. 1, February, 1896. Ilpilla Gorge, Spencer Gorge. Anatomical details, Hedley, *loc. cit.*, p. 221, fig. 50 (*Microphyura*). Refigured, Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, pp. 99, 114, pl. 3, figs. 115-118, September 19, 1917. (Chillagoe Caves, Queensland).  
North Queensland (Chillagoe Caves, *living*). Central Australia.

## Family NITORIDAE.

In an attempt to classify the Zonitid molluscs, it is necessary to recognise three families, the characters of which must be purely anatomical, as no striking shell features are noticeable. Thiele indeed utilised a Stirps Ariophantacea covering one family only, Ariophantidae, which, however, he divided into no less than eighteen subfamilies, forming a somewhat incongruous assembly. One of the subfamilies was the Helicarioninae, but as *Helicarion* is the oldest name in his grouping, the names of the stirps and Family should have been based on this name, as elsewhere this usage was followed. The subfamilies named were Kaliellinae, Ereptinae, Trochonanininae, Microcystinae, Sesarinae, Trochomorphinae, Cystopeltinae, Chroninae, Macrochlamydninae, Ariophantinae, Staffordiinae, Xestinae, Durgellinae, Sophininae, Helicarioninae, Girasiinae, Parmarioninae and Urocyclinae. Such a varied congregation admittedly needed revision, as Thiele indicated by noting the doubtful inclusion of some of the members. So at once the subfamilies may be regarded as distinct families, and thus an incorrect idea of their interrelationship dispelled. Then the further dubious subordinations can be reviewed, such as the inclusion of the Australian genus *Nitor* in the Trochonaninae, but *Nitor* is here differentiated with family rank.

## Genus NITOR Gude, 1911.

1911. *Nitor* Gude, Proc. Mal. Soc. (Lond.), Vol. ix., p. 270, March 30; new name for  
1861. *Thalassia* Albers, Die Heliceen, 2nd ed. (ed. Martens), pp. xvi., 59. Orthotype, *Helix subrugata* Pfeiffer = Reeve. Not *Thalassia* Gistel, Nat. Thier. Schulen, p. 163, 1848.

## NITOR SUBRUGATUS Reeve, 1852.

1852. *Helix subrugata* Reeve, Conch. Icon., Vol. vii., *Helix*, pl. 128, sp. 773, December, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1851, p. 259, December 7, 1853. "New Zealand", error = Clarence River, New South Wales.  
1864. *Helix graftonensis* Cox, Cat. Austr. Land Shells, Add. page No. 137. Clarence River, N.S.W. (Macgillivray).  
1865. *Helix clarencensis* Cox, Proc. Zool. Soc. (Lond.), 1864, p. 595, May 2, 1865. Clarence River, N.S.W. (Macgillivray). Figd. Cox, Mon. Austr. Land Shells, p. 4, pl. iv., figs. 2 a-b, May, 1868.  
Northern New South Wales.

Note.—Cox's Catalogue is dated 1864, and was issued some time after March; it appeared in a blue paper cover; a little later an edition of a slightly larger size came out in a grey paper cover, and included in this

was an additional page of descriptions of four new species, which were numbered 134, 135, 136, 137, but the page was not.

NITOR MORETONENSIS Reeve, 1854.

1854. *Helix moretonensis* Reeve, Conch. Icon., Vol. vii., pl. 188, sp. 1313, July, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1854, p. 52, January 10, 1855). Moreton Bay, Queensland (Strange). Figd. Cox, Mon. Austr. Land Shells, p. 5, pl. x., figs. 2, 2a, May, 1868. South Queensland.

NITOR KREFFTI Cox, 1864.

1864. *Helix krefftii* Cox, Cat. Austr. Land Shells, p. 21. Cape York, Queensland (Macgillivray). Figd. Cox, Mon. Austr. Land Shells, p. 2, pl. x., fig. 8, May, 1868 (*villaris*). North Australia (Cape York).

Note.—On the islands of Torres Strait occurs a similar smaller shell, more depressed, and with a coloured anteperipheral band, which Brazier (Proc. Linn. Soc. N.S.W., Vol. i., p. 100, July, 1876) has recorded as *annulus*. It may be called *Nitor krefftii insularum* subsp. nov., the type coming from Murray Island, and measuring 14 mm. in breadth and 8 mm. in height. The texture is quite different from that of *Nitor* typical, and the shell lacks the keeling and sculpture, and may not even belong to this family, but, in the meantime, a subgeneric name, *Pravonitor*, is proposed. As shown hereafter, *yorkensis* and *villaris* do not refer to shells of this association, though in the past they have been confused.

NITOR PUDIBUNDUS Cox, 1868.

1868. *Helix pudibunda* Cox, Mon. Austr. Land Shells, p. 4, pl. ii., fig. 11, May. Richmond River, N.S.W. (Macgillivray). Northern New South Wales.

Note.—This is not a typical *Nitor*, differing in texture and form, and approximates somewhat to *Malandena*, but until the animal characters are known it cannot be there associated; it may be, however, separated subgenerically as *Modonitor*, the columella being thickened and reflected, and the peripheral keel of *Nitor* is lacking. Note: Two other shells are of doubtful Australian status, viz., *Helix yorkensis* Reeve, Conch. Icon., Vol. vii., pl. 195, sp. 1372, September, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1854, p. 145, April 11, 1855), Cape York, North Australia. The illustration is of a small elevated shell, and the description does not apply to any Cape York species yet known. Specimens in the Cox Collection with a note "These were sent from Cummings as *H. yorkensis*" are certainly not the species figured. The other species is *Helix ductilis* Pfeiffer, Proc. Zool. Soc. (Lond.), 1856, p. 385, May, 1857, Drayton Range, Queensland (Stutchbury). The type was figured by Cox (Mon. Austr. Land Shells, pl. xix., fig. 5, May, 1868) from a painting by Angas. The painting shows a widely umbilicated shell quite unlike any of the Australian forms yet known, and the collection credited to Stutchbury, from the Drayton Range, is full of erroneous localisation.

Family MICROCYSTIDAE.

The species tentatively allotted to this family are certainly conchologically separable from the preceding, and recall the true Microcystid shells, but they will probably be later segregated. Odhner examined the animals and radulae of some species, and showed that the latter differed



in the number and formation of the teeth. Thus the common *rustica* showed a formula with about forty laterals on each side, these being unicuspid. Other species with a similar number of teeth had the laterals bicuspid, and this seemed the more normal style. A third, however, had almost double the number of laterals, bicuspid, as usual, and this agreed with the radula of a member of a different family as noted hereafter.

These differences are here regarded as generic, and names introduced as follows:—*Expocystis*, with *Helix rustica* Pfeiffer as type; *Tarocystis*, with *Microcystis responsivus* Hedley as type; *Melocystis*, with *Helix circumcincta* Cox = *jacksoniensis* Gray as type, with also *Echonitor*, and *Perilocystis*.

Genus *EXPOCYSTIS* nov.

Type, *Helix rustica* Pfeiffer.

Shell small, glassy, flattened, periphery rounded, umbilicus very narrow, but open, columella thickened and reflected.

Radular formula 26.14.1.14.26, teeth unicuspid.

*EXPOCYSTIS RUSTICUS* Pfeiffer, 1852.

1852. *Helix rustica* Pfeiffer, Zeitsch. für Malak., Year ix., No. 7, p. 112; July; new name for  
 1851. *Helix inconspicua* Forbes, Narr. Voy. Rattlesnake (Macgillivray), Vol. ii., p. 379, pl. ii., fig. 3a, "1852" = mid December, 1851. Islet in Trinity Bay, Queensland. Not *H. inconspicua* C. B. Adams, Contr. Conch., iii., p. 37, 1849.  
 1852. *Helix impeza* Reeve, Conch. Icon., Vol. vii., pl. 130, sp. 795, October; new name for *H. inconspicua* Forbes.  
 1864. *Helix crotali* Cox, Cat. Austr. Land Shells, p. 13; new name for *H. inconspicua* Forbes.  
 1854. *Helix villaris* Reeve, Conch. Icon., Vol. vii., pl. 195, sp. 1375, September, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1854, p. 146, April 11, 1855). Lizard Is., North Australia. Figd. Cox, Mon. Austr. Land Shells, p. 2, pl. x., fig. 8, May, 1868.  
 North Queensland (Islands off coast).

Genus *TAROCYSTIS* nov.

Type, *Microcystis responsivus* Hedley.

Shell similar to preceding, but flatter, with the columella thickened and angled, a keel running into the spirally grooved umbilicus.

Radular formula 32.12.1.12.32, teeth bicuspid.

*TAROCYSTIS RESPONSIVUS* Hedley, 1912.

1912. *Microcystis responsivus* Hedley, Proc. Linn. Soc. N.S.W., Vol. xxxvii., p. 262, pl. vii., figs. 36-38, December 13. Bottle Tree Scrub, west of Gladstone, Queensland (S.W. Jackson).  
 South Queensland.

*TAROCYSTIS FULVUS* Odhner, 1917.

1917. *Microcystis fulva* Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, p. 78, pl. iii., figs. 83-85, text figs. 28, 29, 30b, 32, 35a, September 19. Atherton, North Queensland.  
 North Queensland (Atherton Tableland).

Note.—The radular formula is given as 25.13.1.13.25, teeth bicuspid.

TAROCYSTIS ANTIQUUS Odhner, 1917.

1917. *Microcystis antiqua* Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, p. 97, pl. iii., figs. 104-106, September 19. Chillagoe Caves, Queensland (subfossil).

North Queensland (Chillagoe Caves district, *living*).

Note.—This species is commonly living around Chillagoe Caves, and was only found inside through accidental intrusion by means of cracks in the roofs of the caves.

Genus DENDRONITOR Iredale, 1933.

1933. *Dendronitor* Iredale, Rec. Austr. Mus., Vol. xix., p. 56, August 2. Orthotype, *Microcystis inscensa* Hedley.

DENDRONITOR INSCENSUS Hedley, 1912.

1912. *Microcystis inscensa* Hedley, Proc. Linn. Soc. N.S.W., Vol. xxxvii., p. 262, pl. vii., figs. 39-40; pl. viii., fig. 41, December 13. Coolabunia, Queensland.  
South Queensland.

Genus MELOCYSTIS *nov.*

Type, *Helix circumcincta* Cox = *Helix jacksoniensis* Gray.

Shell similar to preceding, but larger and more conical, columella only slightly thickened and reflected, but not angulate, keel missing, umbilicus spirally striate.

Radular formula 60.13.1.13.60, teeth bicuspid.

MELOCYSTIS JACKSONIENSIS Gray, 1834.

1834. *Helix jacksoniensis* Gray, Proc. Zool. Soc. (Lond.), 1834, p. 64, November 25. Near Port Jackson, New South Wales (Allan Cunningham). Figd. Reeve, Conch. Icon., Vol. vii., pl. 207, sp. 1462, December, 1854.  
1868. *Helix circumcincta* Cox, Mon. Austr. Land Shells, p. 3, pl. v., fig. 6, May. New name for  
1864. *Helix marmorata* Cox, Cat. Austr. Land Shells, p. 20. Kiama, New South Wales (Masters). Not *H. marmorata* Férussac, Tabl. Syst. Limaçons, p. 35, 1821.  
New South Wales.

Genus ECHONITOR Iredale, 1937.

1937. *Echonitor* Iredale, South Austr. Nat., Vol. xviii., p. 27. Orthotype, *Thalassia cyrtochila* Gude.

ECHONITOR CYRTOCHILUS Gude, 1905.

1905. *Thalassia cyrtochila* Gude, Journ. Malac., Vol. xii., p. 12, pl. iii., figs. 2 a-b, April 7. Long Reef, South Australia.  
South Australia.

ECHONITOR EUROXESTUS Iredale, 1937.

1937. *Echonitor euroxestus* Iredale, South Austr. Nat., Vol. xviii., p. 27, pl. i., fig. 19. Franklin Harbour, Eyre's Peninsula.  
South Australia (Eyre's Peninsula).

## ECHONITOR ALBUMENOIDEUS Cox, 1868.

1868. *Helix albumenoidea* Cox, Mon. Austr. Land Shells, p. 11, pl. xii., fig. 2, May. Flinder's Range, South Australia.  
South Australia.

## ECHONITOR WATERHOUSEI Cox, 1868.

1868. *Helix waterhousei* Cox, Mon. Austr. Land Shells, p. 3, pl. xix., figs. 6, 6a, May (from a painting of the type by Angas). New name for  
1864. *Helix (Thalassia) subangulata* Angas, Proc. Zool. Soc. (Lond.), 1863, p. 521, April 20, 1864, ex A. Adams & Angas MS. South Australia (no exact locality). Not *Helix subangulata* Pfeiffer, Proc. Zool. Soc. (Lond.), 1854, p. 53, January 10, 1855.  
South Australia.

Note.—This appears to be an erroneous locality, as no shell is at present known from South Australia in agreement.

## Genus PERICLOCYSTIS Iredale, 1937.

1937. *Periclocystis* Iredale, South Austr. Nat., Vol. xviii., p. 28. Orthotype, *P. ardeni* Iredale.

## PERICLOCYSTIS ARDENI Iredale, 1937.

1937. *Periclocystis ardeni* Iredale, South Austr. Nat., Vol. xviii., p. 28, pl. ii., fig. 13. Blinman, South Australia.  
South Australia.

## Genus ALIENITOR nov.

Type, *Helix lyndhurstensis* Cox.

The species so-called by Cox is a small Zonitid of distinct appearance, recalling extralimital forms rather than the local *Nitor-Microcystis* series, being especially separable by the open umbilicus, and the straight, not reflected, columella. It may yet prove to belong to an alien group, hence the name to keep this suggestion under consideration.

## ALIENITOR LYNDHURSTENSIS Cox, 1868.

1868. *Helix lyndhurstensis* Cox, Mon. Austr. Land Shells, p. 11, pl. xvii., fig. 1, May. Lyndhurst, Sydney, N.S.W. (R. L. King).  
New South Wales.

## Genus WESTRACYSTIS Iredale, 1933.

1933. *Westracystis* Iredale, Rec. Austr. Mus., Vol. xix., p. 56, August 2. Orthotype, *Lamprocystis lissa* Smith.

## WESTRACYSTIS LISSUS Smith, 1894.

1894. *Lamprocystis lissa* Smith, Proc. Malac. Soc. (Lond.), Vol. i., p. 86, pl. vii., figs. 22-23, January. North West Australia.  
North West Australia.

## Family MACROCHLAMYDIDAE.

Odhner showed that the animal of a Zonitid from the Bellenden Ker Range should be classed with *Macrochlamys*, as there was a large caudal horn and produced shell lobes. Nevertheless, the radula was very similar to that of (*Microcystis*) *circumcincta*, having the formula, 70.15,1.15.70, while "the anatomy of the genital organs corresponds entirely to that of *Micro-*



*cystis fulva*". The shell was larger than those of the *circumcincta* and *fulva* groups, and quite unlike that of *Nitor*, so that the family Macrochlamydidae is here used temporarily for the location of these larger Zonitids.

Genus MALANDENA Iredale, 1933.

1933. *Malandena* Iredale, Rec. Austr. Mus., Vol. xix., p. 56, August 2. Orthotype, *Macrochlamys suturalis* Odhner.

MALANDENA SUTURALIS Odhner, 1917.

1917. *Macrochlamys suturalis* Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, p. 81, pl. iii., figs. 86-88, September 19. Bellenden Ker Mts., Queensland.  
North Queensland (Bellenden Ker Range).

Family HELICARIONIDAE.

The Vitrinid shells of Australia were early separated under a genus, *Helicarion*, based upon rather superficial animal features. All Australian Vitrinids were then classed under this generic name, and then the genus was regarded as being represented in India, and even Africa. Almost every alien animal investigated by the anatomist has proved dissimilar in detail, and probably the true range of *Helicarion* is quite restricted. I separated three groups as subgenera a few years ago, and these are here elevated to generic rank to assist in classifying this difficult group conchologically.

Genus HELICARION Férussac, 1819-1821.

1821. *Helicarion* Férussac, Tabl. Syst. Limaçons, p. 20, January, p. 16, June (Spelt *Helixarion*, but corrected in Errata); ex Plate ix., Hist. Moll., livr. 4, July 19, vernacular name on plate, but probably scientific name printed on wrapper. Haplo type (or Logotype, Gray, Proc. Zool. Soc. (Lond.), 1847, p. 169, November), *Helicarion cuvieri* Férussac.

HELICARION CUVIERI Férussac, 1819-21.

1821. *Helixarion cuvieri* Férussac, Tabl. Syst. Limaçons, p. 20, January, p. 16, June; ex Hist. Moll., pl. ix., fig. livr. 4, July, 1819. Terres Australes = Tasmania.  
1850. *Vitrina verreauxii* Pfeiffer, Proc. Zool. Soc. (Lond.), 1849, p. 132, January- June, 1850, Australia (Verreaux) = Tasmania.  
[1871. *Helix* (*Paryphanta*?) *vitrinaformis* Legrand, Coll. Mon. Tasm. Land Shells, 1st ed., sp. 58, June, ex Cox MS. Tasmania.  
1879. *Helix buttoni* Petterd, Mon. Land Shells Tasm., p. 55, April. New name for above on account of a prior *Nanina vitrinaformis* "Mousson", Paetel, Catalog. Conch., p. 85, 1873.]  
Tasmania.

HELICARION NIGER Quoy & Gaimard, 1832.

1832. *Vitrina nigra* Quoy & Gaimard, Voy. Astrol., Zool., Vol. ii., p. 135, pl. ii., figs. 8-9. Western Port, Victoria.  
Victoria.

HELICARION FREYCINETI Férussac, 1821.

1821. *Helixarion freycineti* Férussac, Tabl. Syst. Limaçons, p. 24, January; p. 20, June; ex Hist. Moll., pl. ixA., figs. 3-4, livr. 13, 1821. Port Jackson, New South Wales.

1824. *Helicarion freycineti* Quoy & Gaimard, Voy. de l'Uranie, Atlas, Zool., pl. 67, fig. 1.
1824. *V.* (= *Helicolimax*) *australasia* Blainville, Dict. Sc. Nat. (Levr.), Vol. xxxii., p. 255, November 13 (Manuel, p. 462, 1825). New name for preceding.
1834. *Helix* (*Vitrina*) *helicarion* Voigt, Das Thierreich (Cuvier), Vol. iii., p. 76. New name for *H. freycineti* Q. & G.  
New South Wales.

#### HELICARION VIRENS Pfeiffer, 1849.

1849. *Vitrina virens* Pfeiffer, Proc. Zool. Soc. (Lond.), 1848, p. 108, April 25, 1849. Locality unknown = Moreton Bay. Figd. Pfeiffer; Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. i., Abth. xi., p. 24, pl. v., figs. 5-7, 1854. Figd. Reeve, Conch. Icon., Vol. xiii., pl. iii., fig. 14, May, 1862.
1868. *Vitrina aquila* Cox, Mon. Austr. Land Shells, p. 109, pl. xviii., figs. 14, 14a, May. Eagle Scrub, Brisbane, Queensland.  
South Queensland. Northern New South Wales. (Not Victoria).

#### HELICARION HYALINUS Pfeiffer, 1855.

1855. *Vitrina hyalina* Pfeiffer, Proc. Zool. Soc. (Lond.), 1854, p. 296, May 8, 1855. Moreton Bay, Queensland. Figd. Reeve, Conch. Icon., Vol. xiii., pl. ix., sp. 68, May, 1862. Cox, Mon. Austr. Land Shells, p. 85, pl. xiv., figs. 7-7a, May, 1868.
1882. *Helicarion coriana* Godwin-Austen, Land and Freshwater Molluscs, India, pt. ii., p. 65, July, *nomen nudum*.
1883. *Helicarion helenae* Godwin-Austen, Land and Freshwater Molluscs, India, pt. iv., p. 146, pl. xli., figs. 1-8, October. Elizabeth Bay, Sydney, New South Wales (Imported).  
South Queensland.

Memo.—This small tree-living Helicarionid with weak base, rather expanded mouth but rounded spire differs anatomically, as given by Godwin-Austen, cited above, and may be separated subgenerically as *Peloparion* nov.

#### HELICARION PLANILABRIS Cox, 1866.

1866. *Vitrina planilabris* Cox, Journ. de Conch., Vol. xiv., p. 45, January 1; Proc. Zool. Soc. (Lond.), 1865, p. 697, April 24, 1866. Mitchell River, New South Wales (Porter).
1868. *Vitrina macgillivrayi* Cox, Mon. Austr. Land Shells, p. 86, pl. xv., figs. 8-8a, May. New name for preceding.
1868. *Vitrina megastoma* Cox, Mon. Austr. Land Shells, p. 87, pl. xiv., figs. 13-13a, May. Clarence River, N.S.W. (Macgillivray).  
Northern New South Wales. South Queensland.

Note.—This large species with its expansive mouth, its flattened upper surface, and its degenerate base appears to lean towards *Parmacochlea*, and may be subgenerically named *Parmavitrina*.

#### Genus VERCULARION Iredale, 1933.

1933. *Vercularion* Iredale, Rec. Austr. Mus., Vol. xix., p. 38, August 2. Orthotype, *Helicarion bullaceus* Odhner = *Helicarion brazieri* Cox, 1873.



VERCULARION BRAZIERI COX, 1873.

1873. *Helicarion brazieri* Cox, Proc. Zool. Soc. (Lond.), 1873, p. 151, June. Fitzroy Island, North Queensland.  
 1917. *Helicarion bullaceus* Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, p. 77, pl. iii., figs. 79-82, text fig. 27, September 19. Bellen-denker Mts., North Queensland.  
 North Queensland.

VERCULARION STRANGEI Pfeiffer, 1850.

1850. *Vitrina strangei* Pfeiffer, Proc. Zool. Soc. (Lond.), 1849, p. 132, January-June, 1850. Brisbane, Queensland (Strange).  
 1854. *Vitrina strangei* Pfeiffer, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xi., p. 17, pl. ii., figs. 9-12. Also Figd. Reeve, Conch. Icon., Vol. xiii., pl. viii., sp. 48, May, 1862. Cox, Mon. Austr. Land Shells, p. 85, pl. xiv., figs. 9a, 3a, May, 1868.  
 South Queensland.

VERCULARION LEUCOSPIRA Pfeiffer, 1857.

1857. *Vitrina leucospira* Pfeiffer, Proc. Zool. Soc. (Lond.), 1856, p. 326, March 10, 1857. Australia = North New South Wales. Figd. Reeve, Conch. Icon., Vol. xiii., pl. vi., sp. 42, May, 1862. Copied Cox, Mon. Austr. Land Shells, p. 83, pl. xiv., fig. 6, May, 1868.  
 Northern New South Wales.

VERCULARION ROBUSTUS Gould, 1846.

1846. *Vitrina robusta* Gould, Proc. Bost. Soc. Nat. Hist., Vol. ii., p. 181 (dated November). New South Wales (Mr. Mitchell) = Parramatta, near Sydney. Figd. Cox, Mon. Austr. Land Shells, p. 84, pl. xx., fig. 17, May, 1868, from a painting by Angas of a specimen presented by Gould, in the British Museum.  
 1862. *Vitrina inflata* Reeve, Conch. Icon., Vol. xiii., pl. ix., sp. 64, May. Sydney, New South Wales.  
 New South Wales (Sydney district).

VERCULARION MASTERSI COX, 1868.

1868. *Vitrina mastersi* Cox, Mon. Austr. Land Shells, p. 86, pl. xiv., figs. 12, 12a, May. Kiama, New South Wales (Masters).  
 Southern New South Wales.

Genus FASTOSARION Iredale, 1933.

1933. *Fastosarion* Iredale, Rec. Austr. Mus., Vol. xix., p. 37, August 2. Orthotype, *Vitrina superba* Cox.

FASTOSARION SUPERBUS COX, 1871.

1871. *Vitrina superba* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 54, June 12. Mt. Dryander, Port Denison, Queensland. Figd. Cox, Proc. Linn. Soc. N.S.W., Ser. ii., Vol. ii., 1887, p. 1063, pl. xxi., figs. 8-9, March 21, 1888.  
 Mid Queensland.

Genus LUINARION Iredale, 1933.

1933. *Luinarion* Iredale, Rec. Austr. Mus., Vol. xix., p. 38, August 2. Orthotype, *Helicarion thomsoni* Ancey = *Vitrina castanea* Pfeiffer.

## LUINARION CASTANEUS Pfeiffer, 1853.

1853. *Vitrina castanea* Pfeiffer, Mon. Helic. Viv., Vol. iii., p. 5 (pref. May). Australia = South West Australia. Figd. Pfeiffer, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. I., Abth. xi., p. 24, pl. vi., figs. 1-4.
1889. *Helicarion thomsoni* Ancey, Le Naturaliste, 1889, p. 19. Geographie Bay, South West Australia.  
South Western Australia.

## Genus PARMACOCCHLEA Smith, 1884.

1884. *Parmacochlea* Smith, Proc. Zool. Soc. (Lond.), 1884, p. 273, October 1. Haplotype, *P. fischeri* Smith.

## PARMACOCCHLEA FISCHERI Smith, 1884.

1884. *Parmacochlea fischeri* Smith, Proc. Zool. Soc. (Lond.), 1884, p. 273, pl. xxiii., figs. 15, 15a, October 1. Cape York, Queensland.  
North Queensland (Cape York district).

## PARMACOCCHLEA SMITHI Simroth, 1898.

1898. *Parmacochlea smithi* Simroth, Zool. Jahrbuch., Vol. xi., p. 158, pl. xv., figs. 1-10. Cooktown, North Queensland (Micholitz).  
North Queensland (Cooktown district).

Note.—This species is based on anatomical details and could not have been separated by conchological data, so that many species may still be confused in collections from Queensland.

## PARMACOCCHLEA SEMONI Martens, 1894.

1894. *Helicarion semoni* Martens, Denksch. Med. Nat. Gesell., Jena, Bd. viii. (Zool. Forsch. Austr. (Semon), Bd. v.), Moll., p. 87, pl. iv., fig. 8. Burnett River, South Queensland.  
South Queensland.

## Family CYSTOPELTIDAE.

The genus *Cystopelta* has been referred to the family Flammulinidae, and also to the Helicarionidae; such diverse attempts to locate the genus necessitates the introduction of a family to cover such an extraordinary form. It provides an interesting corollary to the importance of anatomical features, as the anatomy is well known. It is here placed alongside the family Helicarionidae as being the most suitable association.

## Genus CYSTOPELTA Tate, 1881.

1881. *Cystopelta* Tate, Papers Proc. Roy. Soc. Tasm., 1880, p. 17 (ante March 30, 1881). Haplotype, *C. petterdi* Tate.

## CYSTOPELTA PETTERDI Tate, 1881.

1881. *Cystopelta petterdi* Tate, Papers Proc. Roy. Soc. Tasm., 1880, p. 17 (ante March 30, 1881). Near Launceston, Tasmania (Petterd).  
North Tasmania.

## CYSTOPELTA BICOLOR Petterd &amp; Hedley, 1909.

1909. *Cystopelta bicolor* Petterd & Hedley, Rec. Austr. Mus., Vol. vii., p. 293, August 30. Magnet Range and Upper Pieman River, Tasmania.  
Tasmania.

CYSTOPELTA PURPUREA Davies, 1912.

1912. *Cystopelta petterdi* var. *purpurea* Davies, Proc. Roy. Soc. Vict., Vol. xxiv. (n.s.), pp. 331-342, pls. lxiv.-lxix., March. Narbethong, Victoria. Victoria.

CYSTOPELTA ASTRA sp. nov.

1890. *Cystopelta petterdi* Hedley, Proc. Linn. Soc. N.S.W., Ser. 2, Vol. v., pp. 44-46, pl. i., June 16. Mt. Kosciusko, N.S.W. New South Wales.

Note.—A species of *Cystopelta* has been found as far north in New South Wales as Barrington Tops, and may even exist farther north still. At the place quoted Hedley noted the differences from the typical species, and since then two different species have been described from intervening localities.

Family DURGELLIDAE.

Thiele's Handbook was not available to me when I wrote upon *Sitala*, and I now find that Thiele had located the Australian "*Sitala*" under *Durgellina*, citing Odhner's anatomical details in that connection. Further study shows that the species previously referred to "*Sitala*" are obviously not congeneric, and perhaps more than one family is represented.

The type of *Durgellina* Thiele (Zool. Jahrb. (Jena), Syst., Vol. 55, p. 135, April 25, 1928) is *D. vitrina*, from the Bismarck Archipelago, a shell conchologically resembling the southern *Turrisitala* more than the North Queensland species, so that it would be unwise to introduce another alien name into our classification. The East Australian species are therefore divided according to their conchological features, and, in addition to *Turrisitala*, it is necessary to add *Sodaleta* with *Helix russelli* Brazier, as type; *Nevelasta* with *Helix pampini* Cox, as type; and *Eclipsena* with *Helix elleryi* Brazier, as type.

Genus TURRISITALA Iredale, 1933.

1933. *Turrisitala* Iredale, Rec. Austr. Mus., Vol. xix., p. 55, August 2. Orthotype, *Helix turriculata* Cox = *T. normalis* Iredale.

TURRISITALA NORMALIS Iredale, 1933.

1933. *Turrisitala normalis* Iredale, Rec. Austr. Mus., Vol. xix., p. 56, August 2. New name for  
1868. *Helix turriculata* Cox, Mon. Austr. Land Shells, p. 8, pl. viii., fig. 11, May. Miriam Vale, Port Curtis, Queensland (Blomfield). Refigd. Hedley, Proc. Linn. Soc. N.S.W., Vol. xxxvii., p. 263, pl. viii., figs. 43-45, 1912. Not *Helix turriculata* Fischer, Oryct. Moscow, 1830. South Queensland.

TURRISITALA WILDIANA sp. nov.

(Plate i., fig. 12.)

Shell larger and more sharply keeled, recalling *elleryi* in form, but differing entirely in sculpture, fine radials being present and concentric lirae absent. Height, 4.25 mm.; diameter, 3.5 mm. Cooktown, Queensland. North Queensland.

TURRISITALA PARRAMATTENSIS COX, 1864.

1864. *Helix parramattensis* Cox, Cat. Austr. Land Shells, p. 20. Parramatta, New South Wales (R. L. King). Figd. Cox, Mon. Austr. Land Shells, p. 8, pl. vi., fig. 10, May, 1868. New South Wales.



Genus *SODALETA* nov.Type, *Helix russelli* Brazier.

Shell small, thin, glassy, broadly conical, base convex, umbilicus narrow, columella sloping, reflected, outer lip thin, mouth squarish, apical whorls flattened, sculpture fine, close radial striae.

*SODALETA RUSSELLI* Brazier, 1875.

1875. *Helix (Conulus) russelli* Brazier, Proc. Zool. Soc. (Lond.), 1874, p. 668, pl. 83, figs. 13-14, April 1, 1875; Trans. Roy. Soc. N.S.W., Vol. viii., 1874, p. 29, 1875. Fitzroy Island, North Queensland.  
North Queensland.

*SODALETA REEDEI* Brazier, 1875.

1876. *Helix (Conulus) reedei* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 101, July. Darnley Island, Torres Strait. Figd. Hedley, Proc. Linn. Soc. N.S.W., Vol. xxvii., p. 20, pl. iii., fig. 45, 1902.  
North Queensland (Torres Straits' Islands).

*SODALETA BARNARDENSIS* Brazier, 1876.

1876. *Helix (Conulus) barnardensis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 101, July. Barnard Is., No. 3, Queensland. Figd. Hedley, Proc. Linn. Soc. N.S.W., Vol. xxvii., p. 21, pl. iii., fig. 44, 1902.  
North Queensland.

*SODALETA DARNLEYENSIS* Brazier, 1876.

1876. *Helix (Conulus) darnleyensis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 102, July. Darnley Is., Torres Straits. Figd. Hedley, Proc. Linn. Soc. N.S.W., Vol. xxvii., p. 21, pl. iii., fig. 43, 1902.  
North Queensland (Torres Straits' Islands).

*SODALETA NEPEANENSIS* Brazier, 1876.

1876. *Helix (Conulus) nepeanensis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 102, July. Nepean Is., Torres Strait. Figd. Hedley, Proc. Linn. Soc. N.S.W., Vol. xxvii., p. 20, pl. iii., figs. 40-42, 1902.  
North Queensland (Torres Straits' Islands).

*SODALETA UMBRACULORUM* Cox, 1864.

1864. *Helix umbraculorum* Cox, Cat. Austr. Land Shells, Add. No. 136. Clarence River, New South Wales (Macgillivray).  
1865. *Helix wilcoxi* Cox, Proc. Zool. Soc. (Lond.), 1864, p. 595, May 2, 1865. Clarence River, New South Wales (Macgillivray). Figd. Cox, Mon. Austr. Land Shells, p. 9, pl. iv., fig. 12, May, 1868.  
New South Wales.

*SODALETA KEMPSEYENSIS* Cox, 1872.

1872. *Helix kempseyensis* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 645, pl. 52, fig. 6, May 2, 1872. East Kempsey, Macleay River, N.S.W.  
New South Wales.

*SODALETA MICROCOSMOS* Cox, 1868.

1868. *Helix microcosmos* Cox, Mon. Austr. Land Shells, p. 3, pl. viii., fig. 12, May. New name for

1864. *Helix microscopica* Cox, Cat. Austr. Land Shells, p. 21. Stroud, New South Wales (Rev. R. L. King). Not *H. microscopica* Krauss, Südaf. Moll., p. 76, 1848.  
New South Wales.

SODALETA SCANDENS COX, 1872.

1872. *Helix scandens* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 645, pl. 52, fig. 5, May 2, 1872. Port Macquarie, New South Wales.  
1905. *Sitala pudica* Gude, Journ. Malac., Vol. xii., p. 11, pl. iii., figs. 3a-b., April 7. Cape Byron, Byron Bay, New South Wales.  
New South Wales.

Note.—The original figure of *H. scandens* Cox is poor, but an authentic cotype proves it to be identical with *Sitala pudica* of Gude, and not referable to *Hedleyoconcha*, where I located it. This leaves the species Cox called *conoidea* and *fenestrata*, as shown in my synonymy, nameless, and I therefore propose *Hedleyoconcha duona* sp. nov. The shell resembles the Queensland *H. delta* in general features, but is broader basally, the umbilicus less open and the sculpture weaker, the type from Terrigal, near Gosford, N.S.W., measuring 9 mm. in breadth by 7 mm. in height. Pl. i., fig. 13.

While investigating this confusion some shells were found which had been collected by C. T. Musson. "In scrubs, arboreal; scarce. North Pine River, South Queensland", and regarded by him as a novelty. Hedley, however, determined them as *Thalassia delta* Pfeiffer, and they were so recorded (Proc. Linn. Soc. N.S.W., Ser. 2, Vol. vi., 1891, p. 553, May 23, 1892). Upon critical examination they prove to be very distinct as Musson first decided, and belong to no known genus, while their family association is doubtful.

The shell is small, conical, but with the apical whorls flattened and boldly spirally lirate, which separates them at sight from *Hedleyoconcha*. The adult sculpture is also unlike that of *Hedleyoconcha*, the reticulation seen in that genus being missing. I therefore propose the new generic name *Mussonula*, as a token of remembrance to that fine conchologist, C. T. Musson, who discovered and recognised it. The apical first whorl and a half is flattened, spirally lirate, the succeeding three whorls radially ridged, the ridges being numerous and close together, the interstices plain; the mouth is squarish, the columella straight, little reflected, the outer lip thin and sharp, the umbilicus open, narrow and deep. Breadth, 6.5 mm.; height, 5 mm. Pl. i., fig. 11.

The specific name will be *verax*, and after careful consideration, *Mussonula verax* may be placed in the family Laomidae, as an elevated relative of *Paralaoma*.

Genus NEVELASTA nov.

Type, *Helix pampini* Cox.

Shell small, globosely sub-conical, thin, pellucid, whorls few, rounded, mouth large, lips thin, columella a little twisted, reflected, covering umbilicus, a slight chink only remaining, sculpture very fine.

NEVELASTA PAMPINI COX, 1868.

1868. *Helix (Conulus) pampini* Cox, Mon. Austr. Land Shells, add. p. 111, pl. xix., figs. 9-9a, after May. Wide Bay, Queensland (Masters).  
South Queensland.

## NEVELASTA LIARDETI Brazier, 1872.

1872. *Helix (Conulus) liardeti* Brazier, Proc. Zool. Soc. (Lond.), 1872, p. 618, November 3. Picton, New South Wales (Liardet).  
New South Wales.

## Genus ECLIPSENA nov.

Type, *Helix elleryi* Brazier.

Shell small, thin, elevated conical, base flattened, practically no umbilical chink, columella straight, reflected, outer lip thin, mouth squarish, apical whorls flattened, adult whorls sculptured with fine regular concentric lirae.

## ECLIPSENA ELLERYI Brazier, 1875.

1875. *Helix (Conulus) elleryi* Brazier, Proc. Zool. Soc. (Lond.), 1874, p. 668, pl. 83, figs. 3-4, April 1, 1875; Trans. Roy. Soc. N.S.W., Vol. viii., 1874, p. 29, 1875. Fitzroy Island, North Queensland.  
North Queensland.

## Family ANOGLYPTIDAE.

In his Handbuch, Thiele admitted a Stirps Acavacea, which included six families, Dorcasiidae, Acavidae, Clavatoridae, Caryodidae, Strophochilidae and Macrocyclidae. Such an aggregation defies all natural laws, and its artificiality dooms it to elimination. The Australian element, the family Caryodidae, is in itself an association of dissimilar forms without phyletic union, and of heterogeneous origin. Four distinct groups, apparently unrelated, are separable, and each are here given family rank.

The single species, *Anoglypta launcestonensis*, of the first family, is a conical umbilicate Helicoid with curious sculpture above, and smooth below, unlike any other living shell, but there is an extinct form, *Helix tasmaniensis* Sowerby (Phys. descr. New South Wales (Strzelecki), p. 298, 1845), which may be ancestral.

## Genus ANOGLYPTA Martens, 1861.

1861. *Anoglypta* Martens, Die Heliceen (Albers), ed. 2, p. 312. Haplotype, *Helix launcestonensis* Reeve.

## ANOGLYPTA LAUNCESTONENSIS Reeve, 1853.

1853. *Helix launcestonensis* Reeve, Conch. Icon., Vol. vii., pl. 149, sp. 968, February. Proc. Zool. Soc. (Lond.), 1852, p. 31, Moll., pl. xiii., figs. 11a-c, November 4, 1853. Launceston, Van Diemen's Land.  
North Tasmania.

## Family CARYODIDAE.

An extraordinary elongate pseudo-Bulimoid from Tasmania has been associated with the preceding on account of its living in Tasmania and laying large eggs! As this form is so peculiar all the races or species have been lumped under one specific name, so that research is necessary to determine accurately the status of the observed variations. Tenison-Woods (Proc. Linn. Soc. N.S.W., Vol. iii., pp. 81-91, pl. vii., December, 1878) discussed the matter nearly sixty years ago.

## Genus CARYODES Albers, 1850.

1850. *Caryodes* Albers, Die Heliceen, 1st ed., p. 141, August. Haplotype, *Bulimus dufresnii* Leach.



CARYODES DUFRESNII Leach, 1815.

1815. *Bulimus dufresnii* Leach, Miscell. Zool., Vol. ii., p. 153, pl. cxx. (end of 1815, acknd. January 11, 1816). New Holland, restricted locality; north of Hobart, Tasmania.  
Tasmania.

Note.—Tenison-Woods noted that the varieties were more or less localised and gave illustrations of the variation. Thus, from Macquarie Harbour, he recognised a large shell, broad, deep maroon (pl. vii., fig. 4), but also small light yellow shells (pl. vii., fig. 7). The differences may be due to altitude; the large broad shell is here named *Caryodes dufresnii superior* subsp. nov., as names are necessary. Port Davey shells were figured as large and narrow with the columella nearly straight (pl. vii., fig. 3); these may be called *Caryodes dufresnii extra* subsp. nov.

In the north, at Ringarooma, a large narrowly elongate form occurs of a chestnut brown coloration (pl. vii., fig. 6), but at Launceston the shells are smaller, though elongate in shape, and with the columella notably twisted (pl. vii., fig. 2). The cause of variation here needs local investigation, but the Launceston form is distinguished as *Caryodes dufresnii dertra* subsp. nov. It is possible that some of the forms are separable specially, and thus the discrepant records may be co-ordinated.

Family PEDINOGYRIDAE.

Associated with *Caryodes*, because both lay large eggs, the huge flattened Helicoids are discordant in shell form as much as any shells can be. Such an unnatural grouping is difficult for any normal student to understand.

Under *Pedinogyra* only one species has been sometimes allowed, and two have been the most hitherto recognised. The great difficulty in distinguishing the species at present is the carelessness of early workers' labelling. Using fresh material, five species, and probably many subspecies, may be determined, but more collections are necessary in the latter case. However, the five species here distinguished are well marked and constant. Shell of medium size, subkeeled at the periphery, brown above, banded, umbilical cavity yellow . . . . . *hayii*.  
Shell much larger, still subkeeled peripherally, uniformly pale above and below, last whorl flattened below . . . . . *allani*.  
Shell still larger and paler, umbilicus wider, but last whorl rounded below . . . . . *allani ultra*.  
Shell small, elevated, dark colour above, umbilical cavity yellow, no peripheral keeling . . . . . *nanna*.  
Shell a little larger than the preceding, dark colour above and below, umbilical cavity dark, no peripheral keeling . . . . . *effossa*.  
Shell small, dark coloured above and below, peripheral keel prominent . . . . . *rotabilis*.

PEDINOGYRA HAYII Griffith & Pidgeon, 1833.

(Plate i., figs. 1, 2.)

1833. *Helix hayii* Griffith & Pidgeon, Animal Kingdom (Cuvier), Vol. xii., Moll., pl. 36, fig. 4. No locality = Hay's Peak, Moreton Bay = Too-woomba, S. Queensland.  
1834. *Helix cunninghami* Griffith & Pidgeon, Animal Kingdom (Cuvier), Vol. xii., Moll., pl. 36\*, fig. 4, ex Gray MS. Same drawing corrected. Index, p. 597, as of Gray.

1834. *Helix cunninghami* Gray, Proc. Zool. Soc. (Lond.), 1834, p. 64, November 25, cites "Griff. Anim. Kingd., t. 6, fig. 4". Hay's Peak, near Brisbane, Queensland (Allan Cunningham).  
 1838. *Helix tupinierii* Eyndoux, Mag. de Zool., 1838, pl. 114. "Manilla" error = Sydney, i.e., Toowoomba, Queensland.  
 South Queensland.

Note.—When Allan Cunningham collected this species at Hay's Peak, which was named in honour of R. W. Hay, Under Secretary of State for the Colonies, he probably signified his desire that this fine shell should also be named for Hay. This was done, and a plate was issued in the Animal Kingdom (Cuvier), prepared by Griffith and Pidgeon, bearing this name. The plate No. 36, was issued in 1833, but unfortunately the shells were reversed in the printing. A corrected plate was given the following year, numbered 36\*, and on this the name was altered to *Helix cunninghami*, and in the Index, published later still, the name was credited to Gray. In most copies the corrected plate only now appears, the printer's instruction, for the destruction of the earlier plate, being faithfully followed, but in the Australian Museum there is a copy with the original plate. In this copy there are also other plates originally reversed, but later corrected, but in no other case is there any alteration of name.

Typical shells are brown above banded with darker brown, the sub-peripheral colouring being darker brown, the umbilical cavity contrasting straw yellow. The periphery shows a keel which disappears on the last half whorl, and the outer lip is dark coloured and strongly thickened. A norm measures 70 mm. in diameter, and 25 mm. in height.

PEDINOGYRA ALLANI *sp. nov.*

(Plate i., figs. 7, 8.)

Shells from Port Curtis are larger, straw coloured above and below, the umbilical cavity brighter, the subperipheral band a little darker, the mouth having the outer lips thickened, but white, the base of the last whorl flattened. This was figured by Cox (Mon. Austr. Land Shells, pl. i., fig. 5), who had commented seventy odd years ago, "Capable of being made a new species", advice for some unknown reason not followed. A still larger shell from the North Pine River is similarly coloured, but has the base of the last whorl more rounded and the umbilicus wider. This reaches 94 mm. in diameter, and 30 mm. in height, and may be called *P. allani ultra* subsp. nov., the typical *allani* measuring 80 mm. in diameter, and 28 mm. in height.

PEDINOGYRA NANNA *sp. nov.*

(Plate i., figs. 9, 10.)

1869. *Helix cunninghami* var. *minor* Mousson, Journ. de Conch., Vol. xvii., p. 60, January 1. Rockhampton, Queensland (Frau Dietrich).

When Cox prepared his first list he also recognised the distinction of this form, which Mousson named as a variety only. Many specimens show it to be very different, the lack of any peripheral keel being notable, the small size, the distinct coloration, and the strongly thickened white lip confirming the specific status of this form, which measures only 50 mm. in diameter, and 22 mm. in height.

PEDINOGYRA EFFOSSA *sp. nov.*

(Plate i., figs. 3, 4.)

Shells from Bundaberg, Queensland, provided another surprise as, resembling *nanna* in shape, they are larger, with the base more excavate, the

huge umbilical cavity all dark coloured, and the lips only slightly thickened; in these features recalling *rotabilis*, but that species has a strong peripheral keel, while this has no signs of a keel. It measures 65 mm. in diameter, and 25 mm. in height, and may be Cox's MS. var. *excavata*, which he localised as from Port Denison, where this genus does not occur—but only as a *nomen nudum*.

PEDINOGYRA ROTABILIS Reeve, 1852.

- 1852. *Helix rotabilis* Reeve, Conch. Icon., Vol. vii., Helix, pl. 70, sp. 361, January. "Australia" = Richmond River, N.S.W.
- 1852. *Helix muhlfeldtiana* Reeve, Conch. Icon., Vol. vii., Helix, text to pl. 70, sp. 361, January, ex Pfeiffer MS. in synonymy. Not *H. muhlfeldtiana* Pfeiffer, Mon. Helix, Vol. i., p. 169, 1848, ex Ziegler MS.
- 1854. *Helix muhlfeldtiana* Pfeiffer, Proc. Zool. Soc. (Lond.), 1852, p. 156, June 27, 1854.. Australia.
- 1869. *Helix cunninghami* var. *compressa* Mousson, Journ. de Conch., Vol. xvii., p. 60, January 1. Australia (Rietman). Not *H. compressa* Rossmässler, Icones L. and S., Moll. Europ., i. (3), p. 2, March, 1836. Northern New South Wales. South Queensland.

Note.—Although this has commonly been known as *muhlfeldtiana*, sometimes as a species, at others a variety only, it will be seen from the synonymy that name has no right at all. Richmond River is selected as the type locality, and Cox remarked that the Clarence River shells were larger, but this is not confirmed by the series available. A number from Canungera, South Queensland, however, are smaller, more elevated, very dark in colouration, with the outer lip whitish. These may be called *P. rotabilis elsa* subsp. nov., the type measuring 47 mm. in diameter, and 23 mm. in height, the Richmond River shells reaching 65 mm. by only 24 mm. Pl. i., figs. 5, 6.

Family HEDLEYELLIDAE.

This delightful series of molluscs, apparently closely allied, ranges from very large, almost globular imperforate or widely umbilicate, shells to a small ear-shaped thin degenerate form. This group is confined to Eastern Australia, the smallest shell living at Mackay, Mid-Queensland, another small one at the boundary of New South Wales and Victoria, but both very large and small species occurring together in their stronghold, the Oxleyan Sub Area.

Genus HEDLEYELLA Iredale, 1914.

- 1914. *Hedleyella* Iredale, Proc. Malac. Soc. (Lond.), Vol. xi., p. 174, September. New name for
- 1861. *Panda* Albers, Die Heliceen, ed. 2 (Martens), p. 149. Orthotype, *Helix falconari* Reeve = Gray. Not *Panda* Van Heyden, Isis. (Oken), 1826, col. 612.

HEDLEYELLA FALCONERI Gray, 1834.

- 1834. *Helicophanta falconeri* Gray, Proc. Zool. Soc. (Lond.), 1834, p. 63, November 25, ex Reeve MS. New Zealand = "70,000 paces from Fort Macquarie" = Hunter River, N.S.W. Figd. Reeve, Conch. Syst., Vol. ii., p. 69, pl. 163, fig. 4, 1841.
- 1846. *Helix infundibulum* Valenciennes, Voy. Venus, Atlas, Tabl., pl. and Moll., pl. i. No locality = Hunter River, N.S.W. Not *H. infundibulum* Hombron & Jacquinot, Ann. Sci. Nat. (Paris), Vol. xvi., p. 64, 1841.



1892. *Panda falconeri* vars. *azonata* and *tigris* Hedley, Rec. Austr. Mus., Vol. ii., p. 31, August, colour varieties only. = Hunter River, New South Wales.
1933. *Hedleyella falconeri jacksoniana* Iredale, Rec. Austr. Mus., Vol. xix., p. 38, August 2. Booyong, Richmond River, New South Wales (S. W. Jackson).
1933. *Hedleyella falconeri imitator* Iredale, Rec. Austr. Mus., Vol. xix., p. 38, August 2. South Queensland.  
Northern New South Wales. South Queensland.

HEDLEYELLA MACONELLI Reeve, 1853.

1853. *Bulimus maconelli* Reeve, Proc. Zool. Soc. (Lond.), 1851, p. 198, Moll., pl. xii., June 29, 1853, ex Brown MS. Brisbane, Moreton Bay, Australia.
1853. *Bulimus maconnelli* Pfeiffer, Mon. Helic., viv., Vol. iii., p. 380, ex Reeve (pref. May), on same specimen.  
South Queensland.

Genus PYGMIPANDA Iredale, 1933.

1933. *Pygmipanda* Iredale, Rec. Austr. Mus., Vol. xix., p. 39, August 2. Orthotype, *Bulimus atomatus* Gray.

PYGMIPANDA ATOMATA Gray, 1834.

1834. *Bulimus atomatus* Gray, Proc. Zool. Soc. (Lond.), 1834, p. 64, November 25. "Near Fort Macquarie, New South Wales" = Hunter River, New South Wales. Figd. Cox, Mon. Austr. Land Shells, p. 71, pl. xiii., fig. 8; pl. xviii., fig. 15, May, 1868.
1892. *Panda atomata* vars. *elongata* and *azonata* Hedley, Rec. Austr. Mus., Vol. ii., p. 31, August, colour varieties only = Hunter River, New South Wales.  
Northern New South Wales.

PYGMIPANDA KERSHAWI Brazier, 1872.

1872. *Bulimus (Liparus) kershawi* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 641, May 2, 1872. Snowy River, Gippsland, Victoria. Figd. Hedley, Rec. Austr. Mus., Vol. ii., p. 31, pl. v., fig. 9, August, 1892. Refigd. Gabriel, Proc. Roy. Soc. Vict., Vol. xliii. (n.s.), p. 66, pl. iii., figs. 1-8, 1930.  
Southern New South Wales. Victoria.

The New South Wales form is smaller and less elongate, the spire being short, the type is from Moonbar, Mt. Kosciusko, and measures 40 mm. in height and 28 mm. in breadth, and is here named *P. kershawi divulsa* subsp. nov.

Genus BRAZIERESTA Iredale, 1933.

1933. *Brazieresta* Iredale, Rec. Austr. Mus., Vol. xix., p. 39, August 2. Orthotype, *Bulimus larreyi* Brazier.

BRAZIERESTA LARREYI Brazier, 1871.

1871. *Bulimus larreyi* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 321, August 16. Bellengen River, New South Wales. Figd. Cox, Proc. Linn. Soc. N.S.W., Ser. 2, Vol. ii., p. 1062, 1887 (with animal).  
Northern New South Wales.

Genus PANDOFELLA Iredale, 1933.

1933. *Pandofella* Iredale, Rec. Austr. Mus., Vol. xix., p. 39, August 2. Ortho-type, *Panda whitei* Hedley.

PANDOFELLA WHITEI Hedley, 1912.

1912. *Panda whitei* Hedley, Proc. Linn. Soc. N.S.W., Vol. xxxvii., p. 254, pl. iv., figs. 1-4, December 13. Near Mackay, North Queensland (S. W. Jackson).  
Mid Queensland (Mackay district).

Superfamily HELICOIDEA.

The Helicid shells must be divided into many families, and the superfamily in Australia alone is represented by distinct series of forms here regarded as families. Thus the *Hadra-Sphaerospira-Meridolum* aggregation is separable from the *Xanthomelon* group, but the allocation of some of the minor series is not easy. The present grouping is tentative, but some attempt must be made to introduce order into the great Helicoid accumulation. Anatomical features will assist, but these must be utilised with caution as in the past their misunderstanding has led to confusion. This can be seen in connection with the Centralian shells dissected by Hedley. Using anatomical details he separated two groups, which he called *Xanthomelon* and *Thersites*, and then allotted the species according to these criteria, and the last state was worse than the first. Shells so similar that they conchologically appeared closely allied were widely dissevered.

Family HADRIDAE.

This family will include the Australian Helicid species, which were referred by Pilsbry years ago to a section of his conglomerate genus *Helix*. To-day it is difficult even to limit the family, as the shell features become modified in many ways, so that members mimic shells referable to other groups and thus confuse superficial observers. Consequently the present arrangement must be regarded as purely tentative, but some basis must be provided to group the species so that order may come out of the chaos at present existing.

Genus HADRA Albers, 1861.

1861. *Hadra* Albers, Die Heliceen, 2nd ed. (Martens), pp. xiv., 165. Ortho-type, *Helix bipartita* Férussac.

The extraordinary variation in size and form in this group has been a source of trouble for local conchologists who attempted to separate the species, using their special knowledge of the actual living conditions. Comparatively recently a learned American authority made an attack—without these safeguards—and his conclusions are tragical. About nine species with an additional eighteen subspecies were distinguished of which very few have any reality. As he ignored published accounts of students such as Brazier and Pace, his localities and forms become so complex as almost to defy correction. Thus he makes Lizard Island the type locality of *forsteriana*, and adds also a subspecies from the same locality, although Brazier had correctly stated that *forsteriana* did not occur on Lizard Island. He then figured as a form of a new species, *lizardensis*, a shell exactly agreeing with the type of *semicastanea* as early recognised by Brazier. Marshall also differentiated the unicolor shell from Murray Island as a distinct species, whereas it is merely a colour variation, even as Pace had

recorded in connection with *bipartita* from the Cape York district. It is very difficult to offer any satisfactory subdivision at present, but it is believed that geographical considerations will prove paramount. If that prove true some of Marshall's names will become available, but many more will also be necessary, as the colonies on each islet appear to differ a little, but individual shells cannot be accurately determined. Therefore here an arbitrary division is put forward as a temporary expedient. The mainland large shells with rounded periphery are regarded as *bipartita*, the southern keeled form as *webbi*, the island large shell from Lizard Island to Cape York as *semicastanea*, while the Torres Strait shells may be called *bartschi*, a small Torres Strait shell being named *funiculata*, and the small southern island series *forsteriana*.

#### HADRA BIPARTITA Férussac, 1822.

1822. *Helix bipartita* Férussac, Hist. Moll., livr. 17, pl. 75, A., figs. 1-2. Australia = Cooktown, North Queensland.
1825. *Helix bipartita* Gray, Annals Philos. (Thomson), n.s., Vol. ix. (Vol. xxv.), p. 410, June, based on Férussac's plate (which must have been published earlier *with name*).
- [1861. *Helix (Hadra) semibadia* Albers, Die Heliceen, 2nd ed. (Martens), p. 165. Philippine Islands. *Nomen nudum*.
1868. *Helix semibadia* Pfeiffer, Mon. Helic., viv., Vol. v., p. 320, for a variety of *Helix bipartita* "peristomate fuscule"; no such variety is known so that this name is indeterminate; the locality cited by Albers suggests an extralimital shell.]
- North Queensland (Cape York to Cooktown).

At the early date of the description of this species Cooktown seems the only place whence this shell could have been received. Férussac's figures agrees very closely with specimens collected at that locality. From the Cape York area Pace (Proc. Mal. Soc. (Lond.), Vol. iv., p. 205, 1901), recorded two colonies, a pale unicolor variety in the scrub at Somerset, while at Vallack Point the shells were all bicolor, but no other differences were recorded as the shape and size were so variable. Pilsbry (Man. Conch. (Tryon), Ser. ii., Vol. vi., p. 126, August 12, 1890), figured a shell (pl. 21, fig. 44), measuring 26 mm. in height by 31 mm. in breadth as a var. *minor*, which may belong to the *semicastanea* series, no locality being given for it. Later (op. cit., Vol. viii., p. 276, July 1, 1893), Pilsbry wrote, "Dr. Cox proposes to call the unicolored yellow form of this species var. *unicolor*". Pace gave the measurements of the unicolor shell as height, 45-59 mm., breadth 58-63 mm. Shells collected at Cook's landing place at Cooktown provide very similar measurements, a smaller specimen agreeing almost exactly with Férussac's figure.

#### HADRA WEBBI Pilsbry, 1900.

1900. *Thersites webbi* Pilsbry, Proc. Acad. Nat. Sci. Philad., 1899, p. 473, figs. 1-2 in text, January 11, 1900. ? Northern Queensland = Cairns district.
1933. *Hadra webbi incallida* Iredale, Rec. Austr. Mus., Vol. xix., p. 43, August 2. Atherton Tableland, North Queensland. Pl. ii., fig. 1. North Queensland (Cairns district).

#### HADRA SEMICASTANEA Pfeiffer, 1849.

1849. *Helix semicastanea* Pfeiffer, Zeitschr. für Malak., Vol. vi., p. 77, November, cites "Chemn., ed. 2, Helix, 319, t. 56, figs. 3-5" (query pub-



- lished). Nova Hollandia ? = Lizard Island, North Queensland.
1927. *Thersites (Hadra) lizardensis lizardensis* Marshall, Proc. U.S. Nat. Mus., Vol. 72, Art. 15, p. 4, pl. 2, fig. 7. Lizard Island.
1927. *Thersites (Hadra) lizardensis rada* Marshall, loc. cit., p. 5, pl. ii., fig. 4. Lizard Island (agrees very closely with Pfeiffer's original figure above cited).
1927. *Thersites (Hadra) semicastanea semicastanea* Marshall, loc. cit., p. 6, pl. ii., fig. 5. (Doubtfully associated here).
1927. *Thersites (Hadra) semicastanea alma* Marshall, loc. cit., p. 7, pl. iii., fig. 8. "Cape York, Queensland". Locality probably incorrect. North Queensland (Islands from Lizard Island northwards).

Note.—Macgillivray pointed out that specimens from the peak of Lizard Island were very large and thin, living under stones; on the lower parts of the island, a smaller, stouter, and brightly coloured, but variable, form was abundant living in the scrubs, about the roots of trees and among dead leaves; while on a mound-like rocky islet, a couple of hundred yards from the shore, there lived a small, dull, solid variety, not exceeding an inch in diameter. Hedley collected a couple of specimens at Restoration Island, which are large for the *semicastanea* series and are more like *bipartita*. One is elevated, the other somewhat depressed, but both agree in their very large size for island shells, and they may be called *blighi* (Pl. ii., fig. 2), to recall that Captain Bligh, of the Mutiny of the Bounty fame, was always interested in shells. Restoration Island was the place Bligh first touched on the Australian coast in his historic struggle, after the Mutiny, to reach Timor.

HADRA BARTSCHI Marshall, 1927.

1927. *Thersites (Hadra) bartschi bartschi* Marshall, Proc. U.S. Nat. Mus., Vol. 72, Art. 15, p. 8, pl. ii., fig. 1. Darnley Island, Torres Strait.
1927. *Thersites (Hadra) bartschi mobiagensis* Marshall, loc. cit., p. 8, pl. i., fig. 1. Mobiag. Island, Torres Strait.
1927. *Thersites (Hadra) bartschi yamensis* Marshall, loc. cit., p. 8, pl. i., fig. 4. Yam Island, Torres Strait.
1927. *Thersites (Hadra) bartschi oma* Marshall, loc. cit., p. 9, pl. iii., fig. 2. Yam Island, Torres Strait.
1927. *Thersites (Hadra) bartschi nura* Marshall, loc. cit., p. 9, pl. iii., fig. 7. Yam Island, Torres Strait.
1927. *Thersites (Hadra) bartschi nesia* Marshall, loc. cit., p. 10, pl. iii., fig. 5. Yam Island, Torres Strait.
1927. *Thersites (Hadra) bartschi paulensis* Marshall, loc. cit., p. 10, pl. iii., fig. 10. St. Paul's Island, Torres Strait.
1927. *Thersites (Hadra) bartschi murrayensis* Marshall, loc. cit., p. 11, pl. i., fig. 5. Murray Island, Torres Strait.
1927. *Thersites (Hadra) bartschi fama* Marshall, loc. cit., p. 11, pl. iii., fig. 9. Murray Island, Torres Strait.
1927. *Thersites (Hadra) bartschi elfa* Marshall, loc. cit., p. 11, pl. iii., fig. 3. Murray Island, Torres Strait.
1927. *Thersites (Hadra) bartschi diva* Marshall, loc. cit., p. 12, pl. ii., fig. 2. Murray Island, Torres Strait.
1927. *Thersites (Hadra) bartschi cepa* Marshall, loc. cit., p. 12, pl. iii., fig. 1. Murray Island, Torres Strait.
1927. *Thersites (Hadra) waltoni* Marshall, loc. cit., p. 12, pl. ii., fig. 3. Murray Island, Torres Strait.

1927. *Thersites (Hadra) dalli* Marshall, *loc. cit.*, p. 13, pl. ii., fig. 8. "North-east Australia" = Murray Island.

North Queensland (Islands in Torres Strait).

Note.—The shells from the islands in Torres Strait are very variable, and individuals cannot be allocated, although a series from each islet shows a similar facies. If these island colonies be named and ranked as subspecies, some of the names introduced by Marshall may be used. More island names will then become necessary as there are series from Nepean Island, which are bicolor, flattened, and merge into the Murray Island series, while the earliest known form is from Warrior Island. This was figured by Hombron and Jacquinot in the *Voy. Pole Sud.*, Atlas, Moll., pl. iii., figs. 7, 8, 9, 1851, or earlier, as questionably *H. bipartita*, and may be called *Hadra (bartschi) quaesita* subsp. nov., as the specimens do not fall into any other island series. Shells are also known of this group from Mt. Cornwallis Island, very close to the New Guinea coast. It may be noted that Marshall recorded four forms from "Yam Island", but there is no such island on the map, and I am told that it is a local name for Yorke or Masig Island.

HADRA FUNICULATA Reeve, 1854.

1854. *Helix funiculata* Reeve, *Conch. Icon.*, Vol. vii., *Helix*, pl. 194, sp. 1363, September, ex Pfeiffer (*Proc. Zool. Soc. (Lond.)*, 1854, p. 147, April 11, 1855). Islands in Torres Strait.

North Queensland (Stephens Island, Torres Strait).

The name was given to a small flattened keeled shell and has been used for many specimens from Stephens Island, which are, as usual, variable in shape, form and colouring, but are all small. No large ones have been seen from this island, otherwise the name would become valid for the Island shells which are here called *bartschi*.

Genus JACKSONENA nov.

Type, *Planispira rudis* Hedley.

The difference between the genera *Hadra* and *Planispira* is apparently of more than generic value, and I here allow them family distinction. Consequently a shell which was placed in *Planispira*, and I consider of Hadroid affinity requires generic nomination. The shell itself is of strange appearance, yet withal a beautiful form, and is one of the many novelties secured by that excellent collector and observer, Mr. Sidney W. Jackson, and I here dedicate the group to him.

The shell is subdiscoid, spire flattened, sutures not impressed, sculpture rough, mouth subangulate as the periphery is acutely keeled, the base convex, columella straight, umbilicus small, deep, open.

JACKSONENA RUDIS Hedley, 1912.

1912. *Planispira rudis* Hedley, *Proc. Linn. Soc. N.S.W.*, Vol. xxxvii., p. 258, pl. vi., figs. 24-27, December 13. Tinaroo scrubs, S.W. of Cairns, Queensland.

North Queensland (Cairns district).

JACKSONENA DELICATA Hedley, 1912.

1912. *Planispira delicata* Hedley, *Proc. Linn. Soc. N.S.W.*, Vol. xxxvii., p. 259, pl. vi., figs. 28-31, December 13. Belson's Scrub, Atherton, North Queensland.

North Queensland (Atherton district).

Genus *ZYGHELIX* nov.

Type, *Helix forsteriana* Reeve.

This little group is one of the most perplexing of all the Queensland series. The shells are of small size, rather depressed, granulosely obscurely sculptured, umbilicus small deep, open, the sloping reflected columella scarcely concealing part of it, coloration pale fawn with reddish concentric bands.

The coloration distinguishes this group, which is mainly represented on the islands off the north coast of Queensland from Cooktown to the Howick Islands, but which also occurs on the mainland adjacent, and thence southward to Cairns. The variation seems to be geographical and colonial, but the forms are not nominated here, the material being insufficient.

*ZYGHELIX FORSTERIANA* Reeve, 1852.

- 1852. *Helix forsteriana* Reeve, Conch. Icon., Vol. vii., pl. 182, sp. 439, March, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1851, p. 254, July 26, 1853). North Australia.
- 1854. *Helix forsteriana* Pfeiffer, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. i., heft. xii., p. 373, pl. 140, figs. 9-10.
- 1860. *Helix hetaera* Pfeiffer, Proc. Zool. Soc. (Lond.), 1860, p. 134, June. Locality unknown.
- 1862. *Helix forsteriana* var. *major* Dohrn, Malak. Blatt., Vol. vi., p. 210, dated November. *Nomen nudum*.
- [*Helix forsteriana major* Pfeiffer, Mon. Helic., viv., Vol. iv., p. 174, 1859. *Helix forsteriana major* Pfeiffer, Mon. Helic., viv., Vol. v., p. 377, 1866. *Helix forsteriana major* Dohrn, Conch. Cab., pl. 171, figs. 8-10, 1879. These names quoted by Marshall, *loc. cit.*, p. 15, do not occur.]
- 1927. *Thersite* (sic) (*Hadra*) *forsteriana forsteriana* Marshall, Proc. U.S. Nat. Mus., Vol. 72, Art. 15, p. 14, pl. ii., fig. 6. "Lizard Island."
- 1927. *Thersites* (*Hadra*) *forsteriana major* Marshall, *ib.*, p. 15, pl. iii., fig. 6. "North-east Australia".
- 1927. *Thersites* (*Hadra*) *forsteriana ada* Marshall, *id. ib.*, p. 15, pl. iii., fig. 4. "Lizard Island".

The type locality of the original species must be determined. Dohrn (Malak. Blatt., Vol. vi., p. 210, 1862) discussed a series sent by Macgillivray separating them into three forms; the largest he named var. *major*, the medium sized ones he called *hetaera*, the smallest, 12-15 mm. in diameter, being regarded as typical. Cox (Mon. Austr. Land Shells, p. 42, pl. iv., fig. 8, May, 1868), published Macgillivray's data (unfortunately after the latter's death), stating that the largest came from Howick Islands, and the smallest from Percy Isles. The last-named locality was obviously incorrect, being well outside the range of this class of Helicoid. Brazier (Journ. de Conch., Vol. xxviii., p. 316, 1880) corrected the latter to Cape Sidmouth, having collected somewhat similar specimens in that locality, and pointed out that this species did not live on Lizard Island.

However, I have now Macgillivray's notebook before me, and he has there written:—Largest shells, Howick Isles, medium size, Rocky Island, and the smallest from Two Isles. Specimens from these localities, collected by Macgillivray, are in the Australian Museum.

Pfeiffer's type of *forsteriana* measured  $20\frac{1}{2} \times 18 \times 12$  mm., and the Rocky Isle form is the one in agreement; *hetaera* was also measured as  $19 \times 16 \times 10\frac{1}{2}$  mm., thus falling as an absolute synonym. The small shells from



Two Isles measure 12-15 mm. in diameter, and the Howick Isles shells 24.5 x 21 x 17 mm. being the major form. Marshall's *ada* was very large, measuring 31 x 27 x 18 mm., but this is reached by a Howick Island shell, so that may be used. Shells from Three Isles are similar but a little larger than Two Isles ones, reaching 15-18 mm. in diameter. Specimens are also available from Flinder's Group, Barrow Island, Cape Sidmouth and the Cooktown district.

ZYGHELIX PRAEHADRA Odhner, 1917.

1917. *Planispira praehadra* Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, p. 97, pl. iii., figs. 101-103, September 19. Chillagoe Caves, North Queensland (subfossil).

North Queensland (Chillagoe Caves district, *living*).

Note.—This species was described as an extinct species from the Chillagoe Caves, but it is living in that locality, and is not unlike the *forsteriana* series.

ZYGHELIX DARWINI Brazier, 1872.

(Plate ii., fig. 8.)

1872. *Helix (Hadra) darwini* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 639, May 2, 1872. North coast of Australia.

The specimens described are now in the Australian Museum, and appear to be closely related to *forsteriana*, and to have come from somewhere north of Cape Sidmouth.

Genus SPURLINGIA Iredale, 1933.

1933. *Spurlingia* Iredale, Rec. Austr. Mus., Vol. xix., p. 47, August 2. Orthotype, *Helix nicomede* Brazier.

SPURLINGIA NICOMEDE Brazier, 1878.

1878. *Helix nicomede* Brazier, Proc. Linn. Soc. N.S.W., Vol. iii., p. 79, pl. 8, fig. 6, December. Cardwell, Queensland. North Queensland.

SPURLINGIA DUNKIENSIS Forbes, 1851.

1851. *Helix dunkiensis* Forbes, Narr. Voy. Rattlesnake (Macgillivray), Vol. ii., p. 378, pl. ii., figs. 7a-b, "1852" = mid-December, 1851. Dunk Island, Queensland. Figd. Cox, Mon. Austr. Land Shells, p. 43, pl. viii., fig. 9, May, 1868. North Queensland.

SPURLINGIA COXENAE Brazier, 1875.

1875. *Helix (Hadra) coxenae* Brazier, Proc. Zool. Soc. (Lond.), 1875, p. 32, pl. iv., fig. 5, June 1. Johnson (= Johnstone) River, Queensland. North Queensland.

SPURLINGIA TINAROOENSIS *sp. nov.*

1912. *Thersites dunkiensis* Hedley, Proc. Linn. Soc. N.S.W., Vol. xxxvii., p. 255, pl. iv., figs. 5-8, December 13. Tinaroo, W. of Cairns, North Queensland.

This species is more obese than *dunkiensis*, measuring 35 mm. in breadth by 25 mm. in height, and has a wider umbilicus with a more pronounced sculpture. The forms of *Spurlingia* may only be of subspecific value, but at present that is not proven, and it will be better to allow them specific value.

North Queensland (Tinaroo district).

*SPURLINGIA EXCELLENS* sp. nov.

(Plate ii., fig. 9.)

Mr. W. D. Campbell sent a shell from Almaden, with the spire depressed, the umbilicus wider than in *dunkiensis*, the mouth smaller, the surface strongly concentrically grained with elongate grains; it measures 31 mm. in breadth and 19 mm. in height.

North Queensland (Almaden district).

*SPURLINGIA CADMUS* sp. nov.

(Plate ii., fig. 6.)

When introducing *nicomede* Brazier described two specimens from Gould (sic) Island. To these he had given the name *cadmus* in MS., and this name is used as this island form is smaller, comparatively more elevated with more rounded whorls. The measurements of the type read: breadth 34 mm., height 24 mm.

North Queensland (Goold Island).

*SPURLINGIA HELGA* sp. nov.

(Plate ii., fig. 4.)

The Hinchinbrook Island shell is still more elevated, an altitude of 28 mm. to the breadth of 34 mm.; the umbilicus is a little less, and the sculpture in this, as well as in the preceding, is much finer than in *dunkiensis*, although of exactly the same kind.

*SPURLINGIA PORTUS* sp. nov.

(Plate ii., fig. 5.)

A specimen from Port Douglas is larger than any of the preceding five, and is flat, a little more elevated than *excellens*, with the same rough sculpture, but with a smaller umbilicus and a larger mouth, measuring 38 mm. by 24 mm.

North Queensland (Port Douglas district).

*SPURLINGIA GEMMA* sp. nov.

(Plate ii., fig. 7.)

Shell smaller than *Zyghelix praehadra*, more elevated, whorls more rounded, and more tightly coiled, umbilicus narrow, open, deep, columella almost straight, scarcely reflected, sculpture of fine horizontal grains, referring it to this genus in preference to *Zyghelix*, where it was first placed. Measurements, 21 mm. in breadth; 15 mm. in height.

North Queensland (Chillagoe township).

Genus GNAROSOPHIA Iredale, 1933.

1933. *Gnarosophia* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. Orthotype, *Helix bellendenkerensis* Brazier.

GNAROSOPHIA BELLENDENKERENSIS Brazier, 1875.

1875. *Helix bellendenkerensis* Brazier, Proc. Zool. Soc. (Lond.), 1875, p. 32, pl. iv., fig. 4, June 1. Bellendenker Mountains, North Queensland. North Queensland.

GNAROSOPHIA BEDDOMAE Brazier, 1878.

1878. *Helix beddomae* Brazier, Proc. Linn. Soc. N.S.W., Vol. iii., p. 80, pl. 8, fig. 6, December. Cardwell, Queensland. North Queensland.

## GNAROSOPHIA CASTANEA Odhner, 1917.

1917. *Thersites castanea* Odhner, Kungl. Svensk. Vetensk. Handl., Bd. 52, No. 16, p. 87, pl. iii., figs. 97-98, text-fig. 44, September 19. Cedar Creek, Bellendenker Mts., North Queensland.

A series collected by Mr. S. W. Jackson at the Tinaroo Scrubs, S.W. of Cairns, are all small, elevated, dark, almost unicolor, and with the umbilicus almost closed. Another series are much larger, elevated, with the mouth expanded, as in the forms of *palmensis*, and consequently the umbilicus fairly open. These are from Innisfail, and the two series are quite distinct and separable from the type of *bellendenkerensis*, while *beddomae* is notable for its coloration, as well as form, and *castanea* is a smaller shell, apparently also separable. At present it seems best to allow these forms specific rank, as the geology of the territory wherein they live is complicated, and at Lake Barrine, on the tableland near Cairns, I found a juvenile of this genus living alongside one of true *Hadra*. This was interesting as *beddomae* has the coloration of the true *Hadra*, and might easily be regarded as a race only "*bipartita*", without special knowledge of its occurrence. While the Tinaroo Scrubs shell may be a form of *castanea*, the large Innisfail shell is here named *G. humoricola* sp. nov., pl. ii., fig. 17, the measurements of the type being 55 mm. in breadth by 45 mm. in height. It may be pointed out in connection with Brazier's measurements that he measured the altitude of the shell as placed on the table, not the vertical axis as we take it to-day. This accounts for the constant discrepancies noted in his figures.

## GNAROSOPHIA MULGRAVENSIS Brazier, 1872.

(Plate ii., fig. 15.)

1872. *Helix (Camaena) mulgravensis* Brazier, Proc. Zool. Soc. (Lond.), 1872, p. 21, June 1. "Mulgrave Island, Torres Strait". Error = Mulgrave River probably.
1889. *Helix mulgravei* Hedley, Proc. Roy. Soc. Queensland, Vol. vi., p. 101, ex Brazier MS. Emendation only.

## GNAROSOPHIA PALMENSIS Brazier, 1876.

1876. *Helix (Hadra) palmensis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 105, July. Palm Isl. (= Great North Palm Island), North East Australia. Figd. Fulton, Journ. Malac., Vol. xi., p. 7, pl. i., figs. 5-6, April 25, 1904.
1881. *Helix palmensis* var. *meridionalis* Brazier, Proc. Linn. Soc. N.S.W., Vol. v., p. 458, February. Large South Palm Island, North East Australia. Not *Helix meridionalis* Wood, Suppl. Index Text, p. 23, 1828.
1933. *Gnarosophia palmensis austrina* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. New name for preceding. Figd. Fulton, Journ. Malac., Vol. xi., p. 8, pl. i., figs. 7-8, April 25, 1904.

North Queensland (Palm Islands).

## GNAROSOPHIA MAZEE Brazier, 1878.

1878. *Helix mazei* Brazier, Proc. Linn. Soc. N.S.W., Vol. iii., p. 79, pl. 8, fig. 5, December. Cardwell, Queensland.
1889. *Helix calamus* Paetel, Cat. Conch. Samml. Paetel, Vol. ii., p. 112, *nom. nud.*, ex Brazier MS. "Austral."

North Queensland (Cardwell district).



GNAROSOPHIA BELLARIA *sp. nov.*

(Plate ii., fig. 16.)

Recalling *palmensis*, but with the columella appressed closing the umbilicus, and the coloration bolder, the bands more separated.  
North Queensland (Hinchinbrook Island).

GNAROSOPHIA RAWNESLEYI Cox, 1873.

1873. *Helix (Camaena) rawnesleyi* Cox, Proc. Zool. Soc. (Lond.), 1873, p. 564, pl. xlviii., fig. 2, November. Mt. Elliott, Port Denison.  
Mid Queensland (Port Denison district).

GNAROSOPHIA MOURILYANI Brazier, 1875.

1875. *Helix (Hadra) mourilyani* Brazier, Proc. Zool. Soc. (Lond.), 1875, p. 31, pl. iv., fig. 1, June 1. Bowen, Port Denison, Queensland.  
Mid Queensland (Port Denison district).

Genus TEMPORENA Iredale, 1933.

1933. *Temporena* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. Orthotype, *Helix whartoni* Cox.

TEMPORENA WHARTONI Cox, 1871.

1871. *Helix whartoni* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 55, pl. iii., figs. 5-5a, June 12. "Port Denison, Queensland" error = Holbourne Island.  
Mid Queensland (Holbourne Island only).

TEMPORENA MITIFICA Iredale, 1933.

(Plate ii., fig. 18.)

1933. *Gnarosophia mitifica* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. New name for  
1864. *Helix incei* var. *multifasciata* Cox, Cat. Austr. Land Shells, p. 9. "Cape York-Murphy" error. Figd. Cox, Mon. Austr. Land Shells, pl. xviii., fig. 1, May, 1868. Not *Helix multifasciata* Weinland & Anton, Malak. Blatt., Vol. vi., p. 17, 1857.  
Queensland.

Memo.—The exact locality whence this fine shell was found is not yet known. Murphy accompanied Leichhardt, and this shell may have been picked up anywhere on the way. It looks just like a very large relative of the island shell *whartoni*.

Genus SPHAEROSPIRA Mörch, 1867.

1867. *Sphaerospira* Mörch, Journ. de Conch., Vol. xv., p. 256, July 1. Logotype Pilsbry, Man. Conch. (Tryon), Ser. 2, Vol. vi. (pt. 24), p. 304, May 1, 1891, *Helix fraseri* "Gray".

SPHAEROSPIRA FRASERI Griffith & Pidgeon, 1833.

1833. *Helix fraseri* Griffith & Pidgeon, Anim. Kingdom (Cuvier), Vol. xii., pl. 36, fig. 6, fig. reversed; 1834, pl. 36\*, fig. 6, figure corrected, Index, p. 597, ex Gray MS. New Holland.  
1834. *Helix fraseri* Gray, Proc. Zool. Soc. (Lond.), 1834, p. 64, November; coll. by Allan Cunningham = Hay's Peak = Toowoomba, South Queensland.

1829. *Helix coarctata* Férussac, Hist. Nat. Moll., livr., 31, pl. 10b, figs. 6-7. No locality. Not *Helix coarctata* Montagu, Test. Brit., Vol. ii., p. 445, 1803.
1835. *Helix capucinus* Férussac, Bull. Univ. Zool., Sect. ii., p. 74, as synonym in review.
1888. *Helix fraseri* var. *flavescens* Hedley, Proc. Roy. Soc. Queensld., Vol. v., p. 151. Colour var. only, Curumbin Creek, Queensland. Not *Helix flavescens* Pfeiffer, Mon. Helic. viv., Vol. i., p. 337, 1848. Northern New South Wales. South Queensland.

Note.—This well known shell appears to show definite local variation as Clarence River specimens are smaller than the typical series and are less elevated, measuring 43 mm. in breadth by 34 mm. in height, and may be called *S. fraseri permuta* subsp. nov. Pl. ii., fig. 13. The ranges of these forms cannot be at present delimited, but the extremes appear very different. A very elevated small form from Stradbroke Island may be called *S. f. feriarum* subsp. nov., measuring 40 mm. by 40 mm. Pl. ii., fig. 14.

SPHAEROSPIRA MOSSMANI Brazier, 1875.

1875. *Helix (Hadra) mossmani* Brazier, Proc. Zool. Soc. (Lond.), 1875, p. 33, pl. iv., fig. 6, June 1. Dawson River, Queensland. South Queensland (Dawson River).

Note.—This has been associated with *fraseri*, but the figure shows a very distinct form, so it must be left as valid until further knowledge of it is gained.

SPHAEROSPIRA PARALLELA sp. nov.  
(Plate ii., fig. 10.)

A shell was collected at Palmwoods, South Queensland, by Mr. Arthur Livingstone, of this Museum, which resembles *S. informis* more than it recalls *fraseri*. It is as large as the former, measuring 45 mm. in height by 55 mm. in breadth, but has the upper whorls flattened, not rounded, and the umbilicus is slightly open. Two others from Nambour confirm this, being larger still, but with the umbilicus closed. A series from North Pine River show this Blackall Range living shell to be very distinct, and the type is selected from this locality, measuring 55 mm. in height by 55 mm. in breadth.

South Queensland (Blackall Ranges).

SPHAEROSPIRA INFORMIS Mousson, 1869.

1869. *Helix informis* Mousson, Journ. de Conch., Vol. xvii., p. 59, pl. iv., fig. 3, January 1. Port Mackay, Queensland.
1875. *Helix infurius* Ten.-Woods, Papers Proc. Roy. Soc. Tasm., 1874, p. 52. Error only. Mid Queensland (Mackay to Bowen).

Note.—The type is a medium sized unicolor shell, but shells from Finch Hatton, 50 miles west of Mackay, are banded, more elevated, with a less open umbilicus, and these may be called *S. i. fringilla* subsp. nov.; pl. ii., fig. 12; this has been figured by Pilsbry (Man. Conch. (Tryon), Ser. ii., Vol. viii., p. 282, pl. 51, fig. 28, July 1, 1893); a series of shells from Mt. Dryander, Port Denison, are larger with more rounded whorls, and the umbilicus almost closed; these are named *S. i. dietrichae* subsp. nov., and this was figured by Pilsbry loc. cit., fig. 27. It may be noted that this is the largest Australian Helicoid, except *Hedleyella*, exceeding *bipartita* in size, measuring 70 mm. in height by 68 mm. in breadth. Pl. ii., fig. 11.

Genus BENTOSITES Iredale, 1933.

1933. *Bentosites* Iredale, Rec. Austr. Mus., Vol. xix., p. 44, August 2. Orthotype, *Helix macleayi* Cox.

BENTOSITES MACLEAYI Cox, 1865.

1865. *Helix macleayi* Cox, Proc. Zool. Soc. (Lond.), 1864, p. 486, text figs., May 2, 1865. Port Denison, Queensland (suggested to be in error for Whitsunday Island, but still doubtful). Figd. Cox, Mon. Austr. Land Shells, p. 45, pl. viii., fig. 3, May, 1868.
1933. *Bentosites macleayi wardiana* Iredale, Rec. Austr. Mus., Vol. xix., p. 44, August 2. Hayman Island, Whitsunday Group, Queensland (M. Ward). Pl. ii., fig. 22.

Mid Queensland (Islands of Whitsunday Passage).

Note.—The subspecific names will be for convenience and saving of space, grouped under the species, as many more will later be named.

BENTOSITES ETHERIDGEI Brazier, 1877.

1877. *Helix (Calliocoehlias) etheridgei* Brazier, Proc. Linn. Soc. N.S.W., Vol. ii., p. 25, July. "Andromache River, near Bowen", error = Hydrometer River, near Mackay, Queensland. Figd. Fulton, Journ. Malac., Vol. xi., p. 9, pl. i., fig. 2, April 25, 1904.
- Mid Queensland.

BENTOSITES GAVISA Iredale, 1933.

1933. *Bentosites gavis* Iredale, Rec. Austr. Mus., Vol. xix., p. 44, August 2. New name for
1871. *Helix gratiosa* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 53, pl. iii., fig. 1, June 12. Whitsunday Island, Queensland. Not *H. gratiosa* Studer, Nat. Anz. Allg. Schweiz. Gesell., Vol. iii., p. 87, 1820.
- Mid Queensland (Whitsunday Island).

BENTOSITES BIRCHI Iredale, 1933.

(Plate ii., fig. 21.)

1933. *Bentosites birchi* Iredale, Rec. Austr. Mus., Vol. xix., p. 44, August 2. Proserpine River, Queensland.
- Mid Queensland (Proserpine River district).

BENTOSITES COXI Crosse, 1866.

1866. *Helix coxi* Crosse, Journ. de Conch., Vol. xiv., p. 195, April 1. New name for
1864. *Helix cerea* Cox, Cat. Austr. Land Shells, p. 36. New name for
1864. *Helix forbesii* Cox, Proc. Zool. Soc. (Lond.), 1864, p. 490, text figs., June 24. Port Denison, Queensland (Masters). Not *H. forbesii* Pfeiffer, Proc. Zool. Soc. (Lond.), 1845, p. 71. Nor *H. cerea* Gould, Proc. Bost. Soc. Nat. Hist., Vol. iii., p. 194, 1850.
1868. *Helix cerata* Cox, Mon. Austr. Land Shells, p. 58, pl. viii., fig. 4, May. New name for *H. cerea* Cox.
- Mid Queensland (Port Denison district).

BENTOSITES CROFTONI Cox, 1872.

1872. *Helix (Helicostyla) croftoni* Cox, Proc. Zool. Soc. (Lond.), 1872, p. 18, pl. iv., fig. 1, June 1. Hydrometer River, Mackay, Queensland.
- Mid Queensland (Mackay district).



## BENTOSITES BLOMFIELDI COX, 1864.

1864. *Helix blomfieldi* Cox, Cat. Austr. Land Shells, p. 19, Miriam Vale, Port Curtis, Queensland (Blomfield). Figd. Cox, Mon. Austr. Land Shells, p. 57, pl. i., fig. 1, May, 1868.
1892. *Hadra blomfieldi* var. *warroensis* Hedley & Musson, Proc. Linn. Soc. N.S.W., Ser. ii., Vol. vi., p. 556, May 23. Warro, near Port Curtis, Queensland.
1933. *Bentosites blomfieldi sidneyi* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Coolabunia, Kingaroy, South Queensland. Pl. ii., fig. 23.
1933. *Bentosites blomfieldi latior* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Mary River, Queensland. Pl. ii., fig. 24. South Queensland (Port Curtis district to the southward).

## Genus VAROHADRA Iredale, 1933.

1933. *Varohadra* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Orthotype, *Helix oconnellensis* Cox.
1933. *Figuladra* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Orthotype, *Helix curtisiana* Pfeiffer.

## VAROHADRA OCONNELLENSIS COX, 1871.

1871. *Helix oconnellensis* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 55, pl. iii., fig. 4, June 12. O'Connell River, near Port Denison, Queensland.
1869. *Helix albofilata* Schmeltz, Mus. Godeff., Cat. iv., p. 73 (pref. May 18). ex Mousson MS., *nomen nudum*. Mackay, Queensland.
1874. *Helix oconnelli* Schmeltz, Mus. Godeff., Cat. v., p. 94, February. Error pro *oconnellensis* Cox = *albofilata* as above.
1874. *Helix albomarginata* Schmeltz, Mus. Godeff., Cat. v., p. 94, February. ex Mousson MS., *nomen nudum*. Bowen, Queensland.
1933. *Varohadra oconnellensis jacksoni* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Finch Hatton, 50 miles west of Mackay, Queensland. Pl. ii., fig. 20.
1933. *Varohadra oconnellensis caroli* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Lindeman Island, Whitsunday Group, Queensland. Pl. ii., fig. 19. Mid Queensland (Port Denison district and islands of Whitsunday Passage).

## VAROHADRA ARTHURIANA COX, 1873.

1873. *Helix arthuriana* Cox, Proc. Zool. Soc. (Lond.), 1873, p. 564, pl. xlviii., fig. 1a, November. "L. Island, Torres Strait". Error = L. Island, Broad Sound, Queensland. Mid Queensland (L. Island).

## VAROHADRA YULEI Forbes, 1851.

1851. *Helix yulei* Forbes, Narr. Voy. Rattlesnake (Macgillivray), Vol. ii., p. 377, pl. ii., figs. 6 a-b, "1852" = Mid December, 1851. Port Molle, Queensland. Mid Queensland (Port Molle).

## VAROHADRA RAINBIRDI COX, 1870.

1870. *Helix rainbirdi* Cox, Proc. Zool. Soc. (Lond.), 1870, p. 170, pl. xvi., fig. 1, November. Mt. Dryander, Port Denison, Queensland. Mid Queensland (Mt. Dryander).

*VAROHADRA STARENA* *sp. nov.*  
(Plate iii., fig. 1.)

From Whitsunday Island shells, similarly coloured to *rainbirdi*, are less elevated, with the umbilicus less open and the base less excavated. Apparently they are also smaller, the type measuring 37 mm. in breadth, and 25 mm. in height.

*VAROHADRA FINDERA* *sp. nov.*  
(Plate iii., fig. 2.)

1890. *Helix basalis* Pilsbry, Man. Conch. (Tryon), Ser. ii., Vol. vi., p. 158, pl. 39, figs. 84-85, December 16. ex Mousson MS. Port Mackay, Queensland. Not *H. basalis* Schmeltz, Mus. Godeffr. Cat. iv., p. 135, 1869.

This species is smaller than *rainbirdi*, though alike in coloration, more elevated, the base excavated, the umbilicus fairly open, and measures 34 mm. in breadth by 28 mm. in height.

*VAROHADRA THOROGOODI* *sp. nov.*  
(Plate iii., fig. 3.)

1890. *Helix rainbirdi* var. Pilsbry, Man. Conch. (Tryon), Ser. ii., Vol. vi., p. 158, pl. 35, figs. 6-7, December 16. Locality unknown exactly = Proserpine and O'Connell River.

This distinct species with its flattened whorls, the sutures scarcely impressed, has the umbilicus well excavated, but has only one antepерipheral orange band. It measures 38 mm. in breadth by 24 mm. in height.

*VAROHADRA MACNEILLI* *sp. nov.*  
(Plate iii., fig. 4.)

A very small flattened member of the *rainbirdi* series was collected by Mr. F. A. McNeill, of this Museum, at Double Cone, an island midway between Bowen and Holbourne Island. It has a narrower umbilicus almost hidden, the base rounded, and a dark periostracum, measuring 30 mm. in breadth by 20 mm. in height.

*VAROHADRA ROCKHAMPTONENSIS* Cox, 1873.

1873. *Helix rockhamptonensis* Cox, Proc. Zool. Soc. (Lond.), 1873, p. 151, June. Rockhampton, Queensland.  
1876. *Helix moresbyi* Angas, Proc. Zool. Soc. (Lond.), 1876, p. 267, pl. xx., figs. 8-9, June 1. Port Denison, Queensland, error = Rockhampton, Queensland.  
1881. *Helix planibasis* Brazier, Proc. Linn. Soc. N.S.W., Vol. v., p. 445, February, ex Cox MS., as a synonym.  
1892. *Hadra rockhamptonensis* var. *pallida* Hedley & Musson, Proc. Linn. Soc. N.S.W., Ser. ii., Vol. vi., p. 556, May 23. Rockhampton, Queensland.

South Queensland (Rockhampton district).

Shells from Mt. Etna Caves district are less elevated, with the umbilicus more covered, the mouth more expanded (and are probably *planibasis* of Cox), measuring 30 mm. in height by 36 mm. in breadth. This may be called *V. r. decreta* subsp. nov. Pl. iii., fig. 5.

*VAROHADRA YEPPOONENSIS* Beddome, 1897.

1897. *Helix (Hadra) yepoonensis* Beddome, Proc. Linn. Soc. N.S.W., Vol

xxii., p. 123, fig. in text (not of type), September 17. Yeppoon, near Rockhampton, Queensland.  
South Queensland (Yeppoon).

VAROHADRA LESSONI Pfeiffer, 1846.

1846. *Helix lessoni* Pfeiffer, Symb. hist. Helic., Vol. iii., p. 71, Australia (probably collected on Voyage Fly): restricted type locality = Percy Isles, S. Queensland. Figd. Syst. Conch. Cab. (Mart. & Chemnitz), cont., Kuster, Bd. i., Abth. xii., Theil. 3, p. 363, pl. 138, figs. 9-10, 1854. South Queensland (Percy Isles).

VAROHADRA AUREEDENSIS Brazier, 1872.

1872. *Helix (Camaena) aureedensis* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 640, May 2, 1872. "Aureed Is., Torres Strait". Error = Port Denison district. Figd. Pilsbry, Man. Conch. (Tryon), Ser. ii., Vol. viii., p. 282, pl. 54, figs. 7, 8, 9, July 1, 1893.  
Mid Queensland (on islands off Port Denison).

VAROHADRA BALA Brazier, 1878.

1878. *Helix bala* Brazier, Proc. Linn. Soc. N.S.W., Vol. iii., p. 78, pl. 8, fig. 4, December. Castle Hill, near Townsville; also Magnetic Island.  
North Queensland (Magnetic Island).

The type is marked Magnetic Island, and shells conspecific have been seen from that locality.

VAROHADRA BERNHARDI Iredale, 1933.

(Plate iii., fig. 7.)

1933. *Varohadra bernhardi* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Rockhampton, Queensland (H. Bernhard).  
South Queensland (Rockhampton district).

VAROHADRA CURTISIANA Pfeiffer, 1864.

1864. *Helix curtisiana* Pfeiffer, Proc. Zool. Soc. (Lond.), 1863, p. 528, April 20, 1864. Port Curtis, Queensland (= Mt. Larcom). Figd. Cox, Mon. Austr. Land Shells, p. 58, pl. xx., fig. 9, May, 1868 (from a painting of the type by Angas).  
1864. *Helix seminigra* Morelet, Journ. de Conch., Vol. xii., p. 289, July 1. Queensland = Port Curtis.  
1869. *Helix basalis* Schmeltz, Mus. Godeffr. Cat., iv., p. 135, ex p. 73, *nom. nud.* (pref. May 18), ex Mousson MS. as a synonym of *curtisiana*.  
1872. *Helix (Hadra) parsoni* Cox, Proc. Zool. Soc. (Lond.), 1872, p. 18, pl. iv., fig. 2, June 1. "Gayndah, Queensland" error; specimens agreeing with description are labelled Miriam Vale; others similar have been collected at Olsen's Caves, none at Gayndah.  
1933. *Varohadra curtisiana exedra* Iredale, Rec. Austr. Mus., Vol. xix., p. 45, August 2. Boyne Island, Port Curtis, Queensland. pl. iii., fig. 6.  
South Queensland (Port Curtis district).

VAROHADRA CONCORS Fulton, 1904.

1904. *Thersites concors* Fulton, Journ. Malac., Vol. xi., p. 8, pl. i., fig. 3, April 25. Gayndah, Queensland.  
South Queensland (Gayndah district).



## VAROHADRA INCEI Philippi, 1846.

1846. *Helix incei* Philippi, Abbild. Besch. Conch., Vol. ii., p. 83, pl. vii., fig. 3, February, ex Pfeiffer MS. Australia (ex Ince) = Percy Islands, South Queensland.
1846. *Helix incei* Pfeiffer, Proc. Zool. Soc. (Lond.), 1845, p. 126, February, 1846. North Australia (Ince). Figd. Pfeiffer, Syst. Conch. Cab. (Martini & Chemnitz), cont. Kuster, Bd. i., Abth. xii., Theil. i., p. 327, pl. 58, figs. 1-3, 1849?
1869. *Helix incei* var. *depressior* Schmeltz, Mus. Godeffr. Cat. iii., p. 73 (pref. May 18), *nomen nudum*. South Queensland (Percy Isles).

Note.—Though this specific name has been used for shells from Port Curtis, it had been collected by Ince, who did not visit that locality. I noted that Port Denison was a better locality, but Forbes, from the personal knowledge of Macgillivray, recorded "Percy Isles, Keppel Is., Port Molle". The figure shows an elevated shell, and specimens from the Keppel Isles and Port Molle are both depressed, so "Percy Isles" is here designated as type locality of *incei*.

## VAROHADRA CHALLISI Cox, 1873.

1873. *Helix (Camaena) challisi* Cox, Proc. Zool. Soc. (Lond.), 1873, p. 565, pl. xlviii., fig. 3, November. "L. Island, Torres Strait"; error = L. Island, Broad Sound, Mid Queensland. Mid Queensland (L. Island).

## VAROHADRA KEPPELENSIS sp. nov.

(Plate iii., fig. 8.)

A series of shells collected by Mr. H. Bernhard on the Keppel Isles generally agree with topotypes of *challisi*, but especially lack the subsutural brown band. They differ from the type of *incei* in their more depressed form. North Keppel Island shells are large and solid, but from Rocky Point, S.W. point of the island, the specimens are smaller, very thin, even fragile and scantily banded. The South Keppel Island shells are still smaller, thin, more elevated, some with the lines numerous, but generally with few lines, the umbilicus narrow almost hidden by expansion of the columella; the lip white; these may be called *V. k. degener* subsp. nov. Pl. iii., fig. 9.

## VAROHADRA MATTEA Iredale, 1933.

(Plate iii., fig. 11.)

1933. *Varohadra incei mattea* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. Rockhampton, Queensland (H. Bernhard). South Queensland.

## VAROHADRA MORTENSENI Iredale, 1929.

1929. *Hadra mortenseni* Iredale, Mem. Queensland Mus., Vol. ix., p. 292, pl. xxxi., fig. 9, June 29. Queensland = Parnassus Range, north of Byfield (R. H. Mortensen). South Queensland (Parnassus Range).

## VAROHADRA VOLGIOLA Iredale, 1933.

1933. *Varohadra volgiola* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. New name for

1872. *Helix andersoni* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 644, pl. 52, fig. 4, May 2, 1872. North end Expedition Range, near Rockhampton, Queensland. Not *H. andersoni* Blandford, Proc. Zool. Soc. (Lond.), 1869, p. 448.  
South Queensland (Expedition Range).

VAROHADRA FORTASSE Iredale, 1933.

(Plate iii., fig. 10.)

1933. *Varohadra volgiola fortasse* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. Lindeman Is., Whitsunday Group, Queensland.  
Mid Queensland (Lindeman Island).

VAROHADRA SAXICOLA *sp. nov.*

(Plate iii., fig. 12.)

A series of shells from Stone Island in Port Denison are small, depressed, recalling *mattea*, but with a red circum-umbilical patch, the umbilicus closed by the appression of the red columella, the outer lip reddish. There is a subsutural red band. This species has been recorded as *incei*, and also as *andersoni* = *volgiola*, but it appears quite distinct from either. Mainland shells from near Bowen are a little more elevated, but otherwise very similar and with the umbilicus sometimes showing a chink.

Mid Queensland (Port Denison district).

VAROHADRA BAYENSIS Brazier, 1875.

(Plate iii., fig. 14.)

1875. *Helix (Hadra) bayensis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 2, April 27. Wide Bay, Queensland.  
South Queensland (Wide Bay district).

Note.—The exact locality of this fine shell is not known, but there are similar shells, but smaller from Tenningering (Mt. Perry), inland from Bundaberg, while Musson recorded *bayensis* from Banbam, near Maryborough. The smaller shell measuring 39 mm. in breadth by 28 mm. in height, outer lip purplish white, expanded columella almost concealing the umbilicus, may be called *Varohadra bayensis reducta* subsp. nov. Pl. iii., fig. 15.

VAROHADRA APPENDICULATA Reeve, 1854.

1854. *Helix appendiculata* Reeve, Conch. Icon., Vol. vii., pl. 193, sp. 1353, August, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1854, p. 149, April 11, 1855). Australia = Bersaker Range, near Rockhampton, Queensland.  
1870. *Helix thatcheri* Cox, Proc. Zool. Soc. (Lond.), 1870, p. 170, pl. xvi., fig. 2, November. Mt. Bersaker, Rockhampton, South Queensland.  
South Queensland (Bersaker Ranges).

Note.—These two are subspecies, the mouth in the latter being white, the typical form having the outer lip dark; the form is characteristic as described, but apparently the shell varies in height, although the depressed shell is the normal one.

VAROHADRA ZEBINA Brazier, 1878.

1878. *Helix zebina* Brazier, Proc. Linn. Soc. N.S.W., Vol. ii., p. 78, pl. 8, fig. 2, December. Douglas River, Queensland.  
North Queensland (inland from Townsville).

VAROHADRA PROBLEMA Iredale, 1933.

(Plate iii., fig. 16.)

1933. *Varohadra probleema* Iredale, Rec. Austr. Mus., Vol. xix., p. 46, August 2. Hamilton Island, Whitsunday Group, Queensland (M. Ward).  
Mid Queensland (Hamilton Island).

VAROHADRA HANNI Brazier, 1876.

1876. *Helix (Hydra) hanni* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 97, July. Bowen, Port Denison, Queensland (Coll. C. Coxen).  
Mid Queensland.

VAROHADRA JOHNSTONEI Brazier, 1875.

1875. *Helix (Hadra) johnstonei* Brazier, Proc. Zool. Soc. (Lond.), 1875, p. 32, pl. iv., fig. 2, June 1. Bowen, Queensland.  
Mid Queensland.

VAROHADRA HILLI Brazier, 1875.

1875. *Helix (Hadra) hilli* Brazier, Proc. Zool. Soc. (Lond.), 1875, p. 32, pl. iv., fig. 3, June 1. Mt. Elliott, Townsville, Queensland.  
North Queensland (Townsville).

VAROHADRA TOMSONI Brazier, 1876.

(Plate iii., fig. 13.)

1876. *Helix (Hydra) tomsoni* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 97, July. Mt. Elliott, Townsville, Queensland.  
North Queensland (Townsville).

VAROHADRA COOKENSIS Brazier, 1875.

(Plate iii., fig. 18.)

1875. *Helix (Hadra) cookensis* Brazier, Proc. Linn. Soc. N.S.W., Vol. i., p. 17, April 27, 1875. "Cooktown, North Queensland", error = Brooke Island, Rockingham Bay, *vide* Brazier.  
North Queensland (Brooke Island).

VAROHADRA PRAETERMISSI Cox, 1868.

1868. *Helix (Camaena) praetermissi* Cox, Mon. Austr. Land Shells, add. page 111, pl. xx., fig. 13 (after May). Cape Direction, North Queensland.  
North Queensland (Cape Direction).

Note.—This locality is very doubtful.

VAROHADRA BEBIAS Brazier, 1878.

1878. *Helix bebias* Brazier, Proc. Linn. Soc. N.S.W., Vol. iii., p. 78, pl. 8, fig. 1, December. Garden Island, Rockingham Bay, Queensland.  
North Queensland (Garden Island).

Note.—The preceding seven species are not too well known; the locality of *hanni* may be incorrect, the type was in a private collection, and has not been figured; the locality given for *johnstonei* is also in doubt, and the figure suggests that it may be related to *rawnesleyi* or *mazee*; although Mt. Elliott is given as locality of *hilli*, many specimens from Bundaberg have been so determined, while many specimens from Frazer Island have been named as *johnstonei* also, by Brazier himself; the type of *tomsoni* was also



in a private collection and unfigured, but specimens from Townsville recently collected appear to agree; *cookensis* was described from Cooktown, but Brazier himself corrected this to Brooke Island, Rockingham Bay; unfortunately specimens from the latter locality so named do not agree with the original description of *cookensis*; *praetermissi* is in like predicament, as it almost certainly did not come from Cape Direction, but from some island south of Rockingham Bay, as far as can be judged from the type specimen preserved in the Australian Museum. Without series there can be no certainty in connection with any of these species.

VAROHADRA RUSSELLI *sp. nov.*

(Plate iii., fig. 19.)

Specimens collected by Mr. F. S. Russell, of the British Great Barrier Reef Expedition, at North Barnard Island, resemble *bebias* Brazier, but are larger, the umbilicus almost closed, the mouth white with a pinkish tinge; no subsutural band, nor red umbilical patch, very fine wrinkle sculpture rarely being present; measurements, 36 mm. in breadth by 27 mm. in height.

North Queensland (North Barnard Island).

VAROHADRA HUBBARDI *sp. nov.*

(Plate iii., fig. 20.)

Some years ago the Rev. Percy Hubbard, then at Innisfail, forwarded some land snails collected on the Johnstone River thereby, and they represent quite a novelty from that district, being small, similar to *tomsoni*, the sculpture showing the faint wrinkling of northern shells, the umbilicus hidden but not closed. The measurements: breadth 34 mm., height 28 mm.

North Queensland (Johnstone River district).

VAROHADRA HALLEYAE *sp. nov.*

(Plate iii., fig. 21.)

A very curious form was collected at Lindeman Island by Mrs. Melbourne Ward, being bright unicolor, brown-red, elevated, umbilicus closed, surface matt, no visible wrinkle sculpture. Height, 28 mm.; breadth 35 mm.

Mid Queensland (Lindeman Island).

VAROHADRA BANFIELDI *sp. nov.*

(Plate iii., fig. 17.)

This species was recorded by Banfield as *fraseri*, and then determined by Hedley as *cookensis* and then again as *appendiculata*. It is nearest the traditional *cookensis*, but is larger, more solid, the umbilicus as a small chink, and the sculpture of the wrinkling style only showing on the earlier whorls. Measurements: breadth 39 mm.; height 32 mm.

North Queensland (Dunk Island).

Genus PALLIDELIX Iredale, 1933.

1933. *Pallidelix* Iredale, Rec. Austr. Mus., Vol. xix., p. 47, August 2. Orthotype, *Helix greenhilli* Cox.

PALLIDELIX GREENHILLI Cox, 1866.

1866. *Helix greenhilli* Cox, Journ. de Conch., Vol. xiv., p. 46, January 1; Proc. Zool. Soc. (Lond.), 1865, p. 696, April 24, 1866. Upper Dawson River, Queensland (Greenhill). Figd. Cox, Mon. Austr. Land Shells, p. 40, pl. ix., fig. 1; pl. xviii., fig. 8, May, 1868.  
Mid Queensland.

## PALLIDELIX SARDALABIATA Cox, 1871.

1871. *Helix sardalabiata* Cox, Proc. Zool. Soc. (Lond.), 1871, p. 54, pl. iii., figs. 3-3a, June 12. Mt. Dryander, Port Denison, North Queensland.  
 1872. *Helix (Hadra) stephensoniana* Brazier, Proc. Zool. Soc. (Lond.), 1871, p. 639, May 2, 1872. Port Denison, Queensland. Pl. iii., fig. 23. Mid Queensland.

Shells from Brooke Island are more elevated with the umbilicus closed, but with the same sculpture as *stephensoniana*; they had been named *spurlingi* by Brazier MS. and this name is used, the type of *P. spurlingi* sp. nov. being: height 30 mm.; breadth 35 mm. Pl. iii., fig. 24.

## Genus MICARDISTA Iredale, 1933.

1933. *Micardista* Iredale, Rec. Austr. Mus., Vol. xix., p. 47, August 2. Orthotype, *Helix barneyi* Cox.

## MICARDISTA BARNEYI Cox, 1873.

1873. *Helix (Camaena) barneyi* Cox, Proc. Zool. Soc. (Lond.), 1873, p. 148, pl. xvi., fig. 2, June. "Barney Island, Torres Strait". Error = Cape Sidmouth, Queensland.  
 North Queensland.

## Genus ANNAKELEA Iredale, 1933.

1933. *Annakelea* Iredale, Rec. Austr. Mus., Vol. xix., p. 43, August 2. Orthotype, *Helix richmondiana* Reeve.  
 1894. *Thersites* Pilsbry, Man. Conch., Ser. ii, Vol. ix., p. 125. (Not *Thersites* Pfeiffer, Zeitschr. für Malak., 1855, p. 141. Tautotype, *Helix thersites* Broderip.).

## ANNAKELEA RICHMONDIANA Reeve, 1852.

1852. *Helix richmondiana* Reeve, Conch. Icon., Vol. vii., pl. lxx., sp. 365, January, ex Pfeiffer (Proc. Zool. Soc. (Lond.), 1851, p. 252, July 26, 1853). Richmond River, New South Wales.  
 1890. *Helix richmondiana* forma *decolorata* Pilsbry, Man. Conch., Ser. ii., Vol. vi., p. 9, August 12. No locality = Richmond River, New South Wales.  
 Northern New South Wales. South Queensland.

## ANNAKELEA MITCHELLAE Cox, 1864.

1864. *Helix mitchellae* Cox, Cat. Austr. Land Shells, p. 19. Clarence River, New South Wales (Mitchell). Figd. Cox, Mon. Austr. Land Shells, p. 65, pl. ix., fig. 9, May, 1868.  
 Northern New South Wales.

## ANNAKELEA PERAGRANS sp. nov.

(Plate iii., fig. 22.)

Apparently this species has been masquerading as *mitchellae*, as Cox figured a similar shell in 1868. In 1864 he had described under the name *mitchellae* a shell measuring 1.056 in. in diameter and 1.015 inches in height. He described it as "elevated" and "angulate", but the later species is much more elevated and is *not* angulate, but has the periphery rounded, and both were localised as from the Clarence River. All the larger shells are from the Richmond River and northwards. From Bangalow, Byron Bay, the largest ones measure nearly two inches high and two inches broad, and these are named as above until topotypical "Clarence River" specimens can

be examined. The type measures 48 mm. in height and 48 mm. in breadth, but some broader shells reach 54 mm. in breadth.

ANNAKELEA TYMPANUM *sp. nov.*

(Plate iii., fig. 25.)

A shell brought back from Mt. Tambourine, South Queensland, by Mr. A. Musgrave, of this Museum, is a remarkable find. Upon examination, it is found to be a giant relative of *novae-hollandiae* = *dupuyana*, whose range lies much to the southward, with the different *mitchellae* and *richmondiana* intervening.

The largest Bellenger River specimen reaches 41 mm. in diameter, while the Tambourine shell measures 47 mm. across with a height of 34 mm.

ANNAKELEA NOVAEHOLLANDIAE Gray, 1834.

1834. *Carocolla novae-hollandiae* Gray, Proc. Zool. Soc. (Lond.), 1834, p. 67, November 25. "200 millia passuum ab Ostio Fluvii Macquarie", error = Scone, New South Wales.
  1850. *Helix depuyana* Jay, Catal., 4th ed., p. 135, n. 3610, *nomen nudum*, ex Pfeiffer MS. (error of spelling only).
  1851. *Helix dupuyana* Pfeiffer, Syst. Conch. Cab. (Mart. & Chemn.), ed. Kuster, Bd. ii., pl. 124, figs. 15-16 (p. 280, 1852, cites "Reeve, Conch. Icon.", and "Pfeiffer, Proc. Zool. Soc. (Lond.), 1851", but the name never appeared in the latter place). East coast of New Holland = Bellingen River, N.S.W.
  1851. *Helix dupuyana* Forbes, Narr. Voy. Rattlesnake (Macgillivray), Vol. ii., p. 371, "1852" = Mid-December, 1851, cites Pfeiffer's plate and gives Bellingen River, N.S.W. (Macgillivray).
  1852. *Helix dupuyana* Reeve, Conch. Icon., Vol. vii., pl. lxxviii., sp. 354, January, ex Pfeiffer.
- Northern New South Wales (Hunter River to Bellingen River).

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EXPLANATION OF PLATE I.

- Fig. 1. *Pedinogyra hayii* Griffith and Pidgeon, under surface.  
 „ 2. *Pedinogyra hayii* Griffith and Pidgeon, side view.  
 „ 3. *Pedinogyra effosa* Iredale, under surface.  
 „ 4. *Pedinogyra effosa* Iredale, side view.  
 „ 5. *Pedinogyra rotabilis elsa* Iredale, under surface.  
 „ 6. *Pedinogyra rotabilis elsa* Iredale, side view.  
 „ 7. *Pedinogyra allani* Iredale, side view.  
 „ 8. *Pedinogyra allani* Iredale, under surface.  
 „ 9. *Pedinogyra nanna* Iredale, under surface.  
 „ 10. *Pedinogyra nanna* Iredale, side view.  
 „ 11. *Mussonula verax* Iredale.  
 „ 12. *Turrisitala wildiana* Iredale.  
 „ 13. *Hedleyoconcha duona* Iredale.

EXPLANATION OF PLATE II.

- Fig. 1. *Hadra webbi incallida* Iredale.  
 „ 2. *Hadra blighi* Iredale.  
 „ 3. *Hadra (bartschi) quaesita* Iredale.



- Fig. 4. *Spurlingia helga* Iredale.  
 „ 5. *Spurlingia portus* Iredale.  
 „ 6. *Spurlingia cadmus* Iredale.  
 „ 7. *Spurlingia gemma* Iredale.  
 „ 8. *Zyghelix darwini* Brazier.  
 „ 9. *Spurlingia excellens* Iredale.  
 „ 10. *Sphaerospira parallela* Iredale.  
 „ 11. *Sphaerospira informis dietrichae* Iredale.  
 „ 12. *Sphaerospira informis fringilla* Iredale.  
 „ 13. *Sphaerospira fraseri permuta* Iredale.  
 „ 14. *Sphaerospira fraseri feriarum* Iredale.  
 „ 15. *Gnarosophia mulgravensis* Brazier.  
 „ 16. *Gnarosophia bellaria* Iredale.  
 „ 17. *Gnarosophia humoricola* Iredale.  
 „ 18. *Temporena mitifica* Iredale.  
 „ 19. *Varohadra oconnellensis caroli* Iredale.  
 „ 20. *Varohadra oconnellensis jacksoni* Iredale.  
 „ 21. *Bentosites birchi* Iredale.  
 „ 22. *Bentosites macleayi wardiana* Iredale.  
 „ 23. *Bentosites blomfieldi sidneyi* Iredalè.  
 „ 24. *Bentosites blomfieldi latior* Iredale.

EXPLANATION OF PLATE III.

- Fig. 1. *Varohadra starena* Iredale.  
 „ 2. *Varohadra findera* Iredale.  
 „ 3. *Varohadra thorogoodi* Iredale.  
 „ 4. *Varohadra macneilli* Iredale.  
 „ 5. *Varohadra rockhamptonensis decreta* Iredale.  
 „ 6. *Varohadra curtisiana exedra* Iredale.  
 „ 7. *Varohadra bernhardi* Iredale.  
 „ 8. *Varohadra keppelensis* Iredale.  
 „ 9. *Varohadra keppelensis degener* Iredale.  
 „ 10. *Varohadra fortasse* Iredale.  
 „ 11. *Varohadra mattea* Iredale.  
 „ 12. *Varohadra saxicola* Iredale.  
 „ 13. *Varohadra tomsoni* Brazier.  
 „ 14. *Varohadra bayensis* Brazier.  
 „ 15. *Varohadra bayensis reducta* Iredale.  
 „ 16. *Varohadra probleema* Iredale.  
 „ 17. *Varohadra banfieldi* Iredale.  
 „ 18. *Varohadra cookensis* Brazier.  
 „ 19. *Varohadra russelli* Iredale.  
 „ 20. *Varohadra hubbardi* Iredale.  
 „ 21. *Varohadra halleyae* Iredale.  
 „ 22. *Annakelea peragrans* Iredale.  
 „ 23. *Pallidelix stephensoniana* Brazier.  
 „ 24. *Pallidelix spurlingi* Iredale.  
 „ 25. *Annakelea tympanum* Iredale.

(To be continued.)